... THE IRON AGE ...

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Old, But Worth Reading Again

HERE are some direct quotations from a document issued by the "Liberty League" of 1776. The sentences are part of the indictment of King George III, in the Declaration of Independence.

"He has erected a multitude of new offices and sent hither swarms of officers to harass our people—"

"He has combined, with others, to subject us to a jurisdiction foreign to our constitutions and unacknowledged by our laws—"

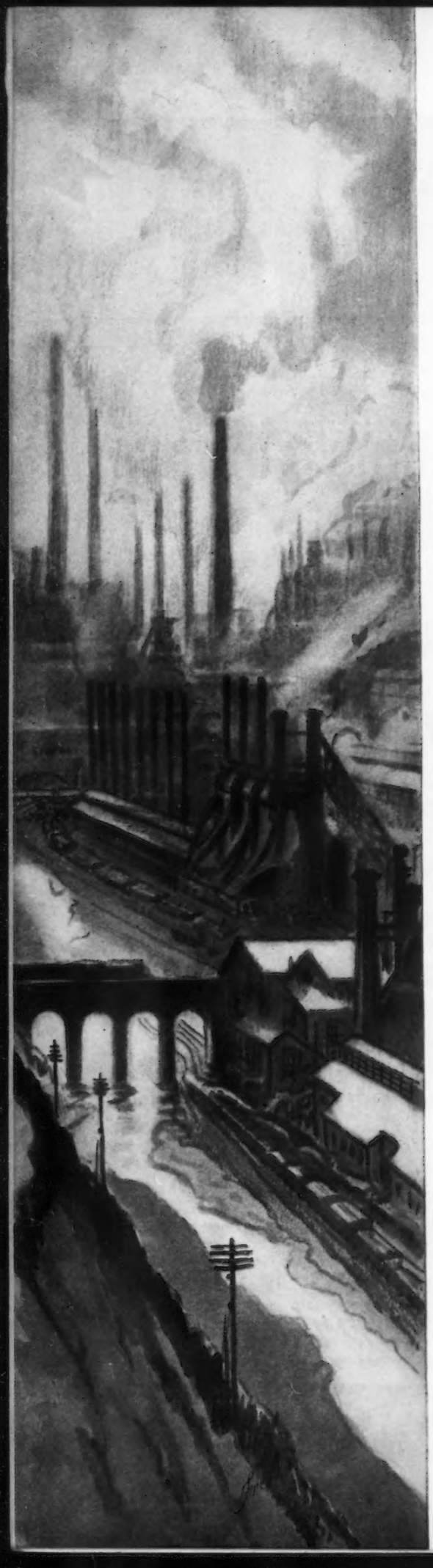
"For taking away our charters and altering, fundamentally, the forms of our government—"

"For suspending our own legislatures and declaring themselves invested with power to legislate for us—"

"He has excited domestic insurrection among us—"

These words were written, 158 years ago. They are worth reading again, today.

John Stuart Vauclain



Industry's Portrayal as a Baseless C

By KENNETH STILLMAN

AMERICAN industry, the toast of the world in the 20's, has been under unremitting attack in the 30's. At her door, all of the cumulative troubles of the depression have been laid. Her accusers have been vocal and influential. Her defenders, in most cases, have been too busy coping with practical every-day problems to present her case to the public. It is only of late that some of the false charges against industry have been thoroughly examined and exploded. Among those who have participated in the work of clearing away unfounded assumptions and expunging fake premises is the author of this article.

He demonstrates that industrial earnings have not been excessive.

MANY of the measures adopted under the New Deal for the purpose of bringing about recovery and reformation of our national economic and social system seem to have been based, primarily, on the following assumptions:

That property and capital interests have been getting a disproportionate share of the national income.

That the depression was caused, chiefly, by the exorbitant profits levied against the national income by owners and managers of business enterprises.

That purchasing power was not distributed freely and equitably between capital and labor so that all the available goods and services produced could be bought.

That labor has suffered most severely during the depression and is in greatest need of emergency relief and permanent aid.

This list includes familiar arguments used by the sponsors of the New Deal to justify the extraordinary and quite unprecedented measures they have adopted to regulate and control American business, with the avowed purpose of attaining an economic and social Utopia for the nation.

Lacking any definite information about actual conditions or their causes, but eager to find scapegoats to bear the burden of blame for the obviously deplorable state the country was and still is in, the general public, supported by most of the press, accepted these assumptions as a modern Law of Moses and, to a surprising extent, gave their wholehearted support to every new proposal ostensibly designed to correct these flagrant evils and to restore and maintain national prosperity.

It is very unfortunate that so much public approval has been given to a program based upon assumptions which, in many instances, are invalid and can easily be demonstrated to be

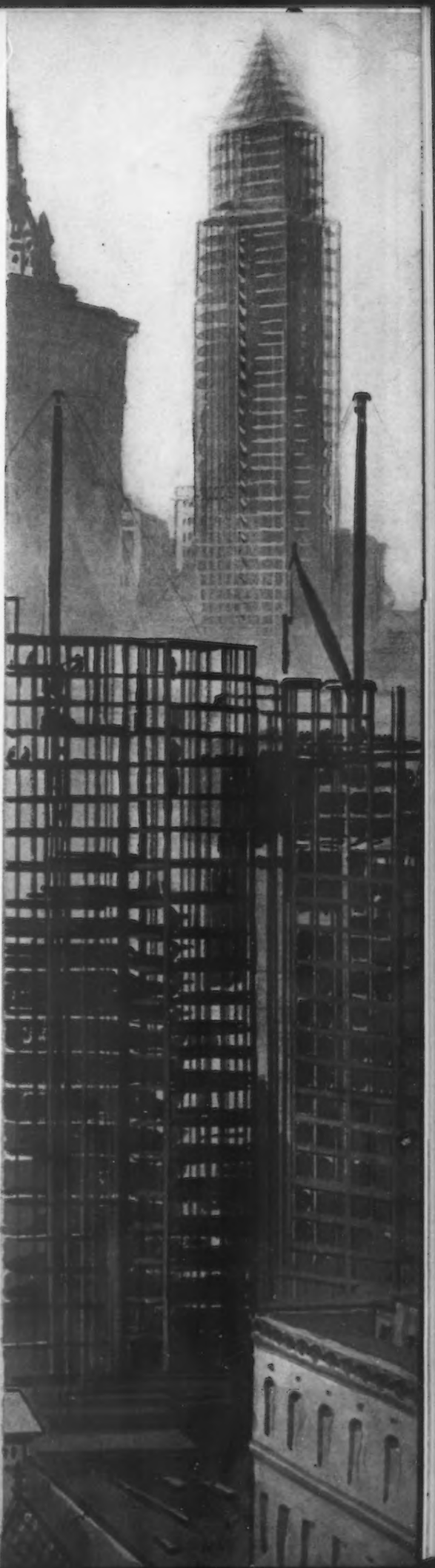
a Black Sheep Is a Canard

He shows that the salary burden in industry has been small, and, contrary to the general impression, smallest in the largest corporate units.

He makes it clear that labor's share of production has increased, rather than decreased, during the depression.

He proves that labor has suffered not because it did not get its full portion of what was produced but because so little was produced. In other words, lack of work rather than poor pay has been the real problem of the depression.

He shows that unemployment is a direct outcome of the lack of balance among different economic groups, with the heavy industries incurring the largest losses.



false by reference to official information readily available to any interested person.

Net Income of Industry Has Been Low

"Statistics of Income," published by the United States Treasury, is one such source. Income data for all manufacturing corporations in the United States disclose that during the 15 years from 1919 to 1933, inclusive, the average proportion of net income or profits to gross income or sales was 3.74 per cent. See Table I.

Including the three years 1921, 1931 and 1932, when there was a net deficit —of 6.43 per cent in 1932—there has been no year since 1919 when the average net income of all manufacturing corporations has exceeded 6 per cent. In only six of the 15 years, in 1922, 1923, 1925, 1926, 1928 and 1929, was it 5 per cent or more.

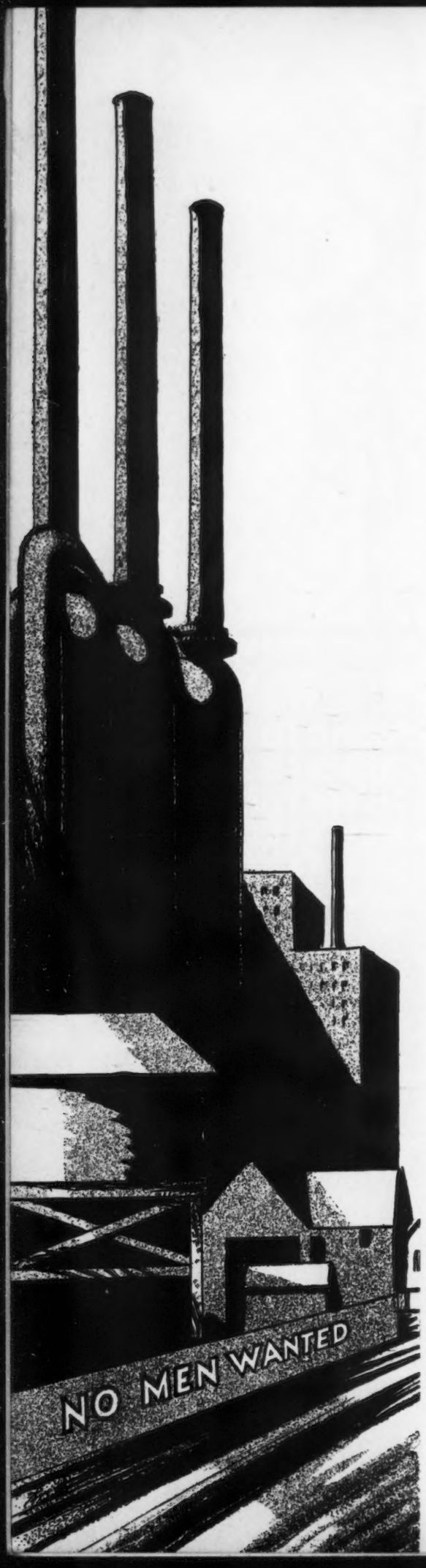
An average of less than 4 per cent net income over a period of 15 years —less than the return on high-grade bonds and mortgages—with average net profits more than 6 per cent in only one year, offers little support for the New Dealer's argument that the depression was caused primarily by the exorbitant profits of industry and the resulting failure to distribute purchasing power widely enough to permit the available volume of goods and services to be purchased and consumed.

Further substantiation of this conclusion is a report recently made by the National City Bank of New York, of a study of the changes in profits and net worth from 1932 to 1933 of 1925 business corporations which had a total net worth of nearly 50 billion dollars on Jan. 1, 1933. See Table II.

During 1932 the total net profits of all these corporations were $1,151,-187,000, a return of 0.3 per cent on their net worth. Of the 63 separate industrial and business classifications into which the 1925 corporations are divided, 37 had net deficits as a result of the year's operation and only 26 made any profits at all.

Business improved a little during 1933 but the net profits of the group totaled only $1,045,019,000, or 2.1 per

920 ▲▲▲



cent return on the net worth of the 1925 corporations at the beginning of the year. Forty-one more industrial groups succeeded in breaking into the profit column during 1933, but 22 groups continued to operate at a loss.

Profits Obtained by "Writing Down" Investment

Many of the improvements in net income reported in 1933 were the result of rising prices, which had the effect of accelerating sales, preventing further write-downs of inventory values and permitting higher profit margins. Also there was an extensive writing off of obsolete and idle plant and equipment. The resulting reduction in shareholders' equities in the corporations made possible further reductions in depreciation and overhead charges so that profits could be made from a smaller volume of business than before. This drive for operating economy, plus the payment of dividends in excess of those earned, reduced the total net worth of the 1925 corporations $3,500,000,000 during 1933, or 6.7 per cent of their value on Jan. 1, 1932.

The change from practically no net profit in 1932 to a profit in 1933 was encouraging. But a return of only 2.1 per cent upon net worth which had been so sharply reduced during the year was nothing to boast about.

Largest Losses in Heavy Industries

Of still greater usefulness in understanding the real causes of the depression is a study of these 1925 corporations segregated into three great groups of capital goods industries, consumer goods industries and service industries. See Table III.

The durable goods group includes 402 corporations in 12 industries. All but two of these industries, with a total net worth of $9,450,000,000 in 1932, operated at a loss in 1932, and one of those two was unable to make a profit in 1933. The deficit of the group was $322,000,000 in 1932, or 3.4 per cent of the net worth. In 1933 the deficit was $110,000,000, or 1.3 per cent of the net worth that year which had been reduced $815,000,000, or 8.6 per cent, from the 1932 value.

Now look at the consumer goods group, which includes 671 corporations in 23 industrial families and whose total assets in 1932 were $13,842,000,000. During 1932 only 11 of the 23 industry groups failed to make profits and the consumer goods industries as a whole made net profits of $257,000,000, or 1.9 per cent return on net worth. During 1933 every member group made profits. The total net income was $580,000,000, or 5.1 per cent of net worth at the beginning of the year. But total net worth dropped $2,506,000,000, or 18.3 per cent, from 1932 to 1933.

Finally there are the service industries, which include 643 corporations in 16 industrial groups, with total assets of $28,483,000,000 in 1932. This group, like the consumer goods industry, made profits in 1932 and in 1933, but considerably smaller in each year. In 1932, when nine of the 16 members of the group operated at a loss, the total net profits were $244,000,000, 0.9 per cent return on the assets of the group. During 1933 only three of the 16 failed to break from red to black and total net profits for all increased to $491,000,000, or 1.8 per cent of the 1933 net worth, which had dropped only a little to $27,056,000,000.

Because there is always a possibility for a dispute over accounting procedure used to determine the net worth of a corporation and the profits it makes, a check on the accuracy of the figures cited before can be made by an analysis of the average profit on sales, evidently a true measure of the share of corporate wealth produced which is retained by its owners. Again the National City Bank has come to our assistance and has analyzed the returns of 240 large corporations which report sales. See Table IV. During 1933 their total sales were $5,598,000,000 and net profits were $48,700,000, an average return of 0.9 per cent, although only two of the 11 industrial groups included in the list failed to make some profit during the year.

Outgo Greatly Exceeds Income

Still further and more conclusive evidence to dispute the arguments of the New Dealers may be found in the study of national income from 1929 through 1932 recently completed by the United States Department of Commerce. Two questions were answered by this research:

(1) What were the values of all the goods and services produced in the country during the four years which made up the total national income produced?

(2) How was the national income which was paid out distributed among wage earners, salaried workers, owners of stocks, bonds and mortgages, of real estate and of patents and other rights, and among individual owners and operators of business enterprises?

Table V gives a summary of these data. Total national income produced declined from $83 billions in 1929 to $39 billions in 1932, a drop of 53 per cent, while total national income paid out dropped only from $81 billions in 1929 to $49 billions in 1932, only 40 per cent.

As a result of this, withdrawals from the savings of the nation, totaling more than $23 billions—almost as large as the Federal debt—were made during the period studied in an heroic effort by the much maligned owners of the national wealth to prevent or retard the slide to national disaster. The only source which could and did provide this enormous sum in excess of the values actually produced during the depression, for distribution mostly among wage earners, was the savings of the nation, better known as capitalistic resources. This is an excellent example of how badly this class, now subjected to such criticism by New Dealers, suffered during the depression.

Further analysis of this Government report, illustrated in Table VI, shows to what classes of income-receiving individuals national income paid out was distributed. Compared with 1929, 60 per cent less was distributed in wages in 1932, 41 per cent less in salaries, 30 per cent less to owners of property, and 44 per cent less to entrepreneurs. This looks as if labor fared worse than any other group but it is not the case.

Employment Declined Less Than Income Produced

Unemployment, and not low wages, was the principal cause of depression distress. Employment of persons who normally work for their living declined only 23 per cent from 1929 through 1932 while national income produced was 53 per cent less. The per capita income of all employed workers, including those working part time, declined only 19 per cent during the four years, from $1,475 in 1929 to $1,199 in 1932. Adjusting these money incomes by the cost of living index compiled by another Government agency—the Bureau of Labor Statistics—discloses that in real purchasing power, workers with jobs in 1932 could buy 1 per cent more with their annual earnings than they could with what they were paid in 1929. See Table VII.

Labor's Share of Production Mounted

This comparison was based on national income paid out. A truer picture of business operations is obtained by the use of national income produced which does not include withdrawals from savings but only the values actually *produced* during the four years. Total payments to labor increased from 63.5 per cent of national income produced in 1929 to 80.2 per cent in 1932. See Table VIII. This is the ratio of the total wages, salaries, pensions and other workers' benefits paid to all employed labor, to the total value of all the goods and services of all kinds produced in the country, whether any hired labor was used to produce them or not. National income produced includes not only the products of manufacturing industries but of agriculture, transportation, trade, mining, the professions, domestic and personal service and the many branches of local, State and national government.

As shown in Table VI, the distribution of national income *paid out* among the major groups of individuals who received it remained fairly constant during the four years. Labor continued to receive about 65 per cent of the total, property owners got 16 per cent and entrepreneurs withdrew about 19 per cent each year. The income of all groups declined because of unemployment, wage cuts, falling prices, reductions or stoppage of dividend payments, defaults of interest and otherwise. But the more rapid fall of prices during the four years increased the real purchasing power of the dollar to an extent which probably made 1932 income only 25 per cent less than it was in 1929.

It is obvious that in such an economic disaster as struck the country, the working class, which has small financial reserves but which greatly outnumbers other income-receiving groups, would suffer most. But, as noted before, payments to labor remained at 65 per cent of the national income paid out throughout the four years so there was no general discrimination against it as a class. On

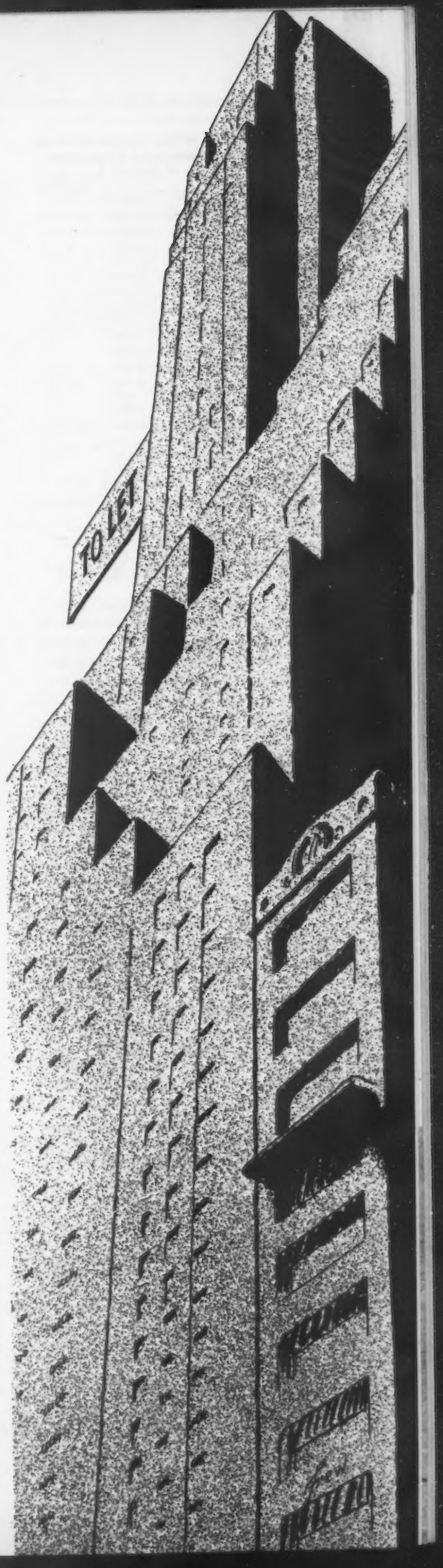


Table I—Relation of Net Income to Gross Sales for all Manufacturing Corporations (Millions of Dollars)

	Sales or Gross Income	Net Income	Per Cent Net to Gross
1919	$52,290	$3,493	6.68
1920	56,649	2,337	4.13
1921	38,442	D–473	D–1.23
1922	44,683	2,251	5.04
1923	56,221	3,086	5.49
1924	53,911	2,334	4.33
1925	60,830	3,154	5.18
1926	62,495	3,124	5.00
1927	63,723	2,580	4.05
1928	67,273	3,366	5.00
1929	72,132	3,862	5.35
1930	58,650	801	1.37
1931	44,033	D–988	D–2.24
1932	23,846	D–1,533	D–6.43
1933*	5,598	49	0.9
Averages	$53,941	$2,028	3.74

D—Deficit.
(From "Statistics of Income," United States Treasury.)
* 240 companies.

the contrary, the fact that labor's share of national income produced in 1932 had increased to 82.5 per cent of the total is evidence that it had been specially favored.

Business Earnings Off More Than Earnings of Labor

Furthermore, Table X shows that the average incomes of corporations and of individual proprietors in agriculture, mining, manufacturing, construction, transportation, trade and finance declined more from 1929 to 1932 than did the average income of labor.

Table VI shows that from 1929 to 1932 dividend payments dropped 56.5 per cent while payments of wages and salaries dropped 40.5 per cent. It should be remembered, too, that during the last three years of the period studied, payments of dividends, if made, were taken in increasing proportion from savings of previous

Table II—Corporation Profits—1932 and 1933

Number of corporations	1,925
Net profits, 1932	$1,151,187,000
Net profits, 1933	$1,045,019,000
Per cent change, 1932 to 1933	+59.1
Net worth, Jan. 1, 1932	$53,451,506,000
Net worth, Jan. 1, 1933	$49,880,118,000
Per cent change, 1932 to 1933	—6.7
Per cent return on net worth, 1932	0.3
Per cent return on net worth, 1933	2.1

(From National City Bank of New York.)

Table III—Corporation Profits—1932 and 1933 by Economic Groups

No. of Corpns.	Industry	Net Profit (Millions) 1932	Net Profit (Millions) 1933	Net Worth (Millions) 1932	Net Worth (Millions) 1933	Per Cent Return 1932	Per Cent Return 1933
	CAPITAL GOODS INDUSTRIES						
9	Agricultural implements	D–$23	D–$11	$500	$469	D–4.5	D–2.3
54	Building materials	D–23	D–9	575	493	D–4.0	D–1.8
13	Construction	1	D–3	124	105	1.2	D–2.9
45	Electrical equipment	D–27	D–14	1,067	961	D–2.5	D–1.5
25	Heating and plumb'g equip.	D–20	D–5	361	315	D–5.5	D–1.6
54	Iron and steel	D–165	D–73	4,041	3,806	D–4.1	D–1.9
9	Lumber products	D–2	D–1	36	33	D–5.6	D–3.0
72	Machinery	D–38	D–18	521	448	D–7.3	D–4.0
11	Mining—copper	D–10	D–4	301	289	D–3.3	D–1.4
28	Mining—other non-fer.	6	43	776	718	0.7	5.9
26	Railway equipment	D–16	D–12	921	808	D–1.7	D–1.5
32	Real estate	D–4	D–3	227	190	D–1.8	D–1.6
402	Totals	D–$322	D–$110	$9,450	$8,635	D–3.4	D–1.3
	CONSUMER GOODS INDUSTRIES						
26	Apparel	D–$8	$3	$143	$118	D–5.6	2.7
18	Automobiles	D–30	83	1,264	1,122	D–2.4	7.4
55	Auto. accessories	D–21	1	379	315	D–5.5	0.1
21	Bakeries	28	24	368	345	7.5	7.1
24	Chemical	64	98	1,289	1,218	5.0	8.0
26	Confect'ery and Beverage	25	33	230	223	10.8	15.0
55	Cotton mills	D–14	13	343	324	D–4.1	4.1
11	Dairy products	20	14	340	322	6.0	4.2
22	Drugs and sundries	34	32	271	257	12.6	12.3
45	Foods—misc.	52	68	797	726	6.5	9.4
34	Household supplies	4	20	379	323	0.9	6.1
20	Meat packing	D–2	23	648	625	D–0.3	3.6
12	Leather tanning	D–8	8	98	88	D–8.2	9.5
42	Paper and products	D–10	0	429	406	D–2.3	0
62	Petroleum	35	19	3,094	2,685	1.1	0.7
11	Restaurant chains	1	0	78	63	1.6	0
24	Rubber tires	D–15	11	496	465	D–3.0	2.4
18	Shoes	3	13	205	186	1.6	6.9
22	Silk and hosiery	D–4	3	102	84	D–3.9	3.6
34	Sugar	9	18	383	374	2.3	4.9
32	Textiles—misc.	D–15	14	320	281	D–4.7	4.8
27	Tobacco	119	74	889	895	13.4	8.3
8	Wool	D–10	9	97	91	D–10.3	10.3
671	Totals	$257	$580	$13,842	$11,336	1.9	5.1
	SERVICE INDUSTRIES						
15	Amusements	D–$20	0	$295	$258	D–6.8	0
13	Aviation	D–4	0	102	61	D–3.4	0
29	Printing and Publishing	8	$5	184	170	4.3	2.9
46	Merchandising—chains	57	91	779	745	7.3	12.2
32	Merchandising—dept. stores	D–17	1	287	241	D–5.9	0.4
5	Merchandising—mail order	D–8	15	348	311	D–2.3	4.9
27	Merchandising—wholesale	D–9	4	176	148	D–5.1	2.6
33	Misc. service	D–12	D–10	229	204	D–5.2	D–4.9
151	Class I railroads	D–151	D–14	12,721	12,393	D–1.2	D–0.1
85	Electric, gas, etc	354	297	5,541	5,377	6.4	5.5
24	Bell telephone system	139	129	2,889	2,781	4.8	4.6
21	Street railways	2	1	620	613	0.3	0.2
45	Banks and trust companies	D–46	D–180	2,174	1,954	D–2.1	D–9.2
50	Insurance	D–77	93	562	445	D–13.7	21.0
50	Investment trusts	5	29	1,241	1,035	0.4	2.8
25	Finance companies	23	30	335	320	6.7	9.2
643	Totals	$244	$491	$28,483	$27,056	0.9	1.8
1,925	Grand Totals	$1,151	$1,045	$53,452	$49,880	0.3	2.1

D—Deficit.
(Data from National City Bank of New York.)

Table IV—Manufacturing Net Profits and Sales—1933
(Thousands of Dollars)

No. of Corpns.	Industry	Profit	Sales	Per Cent Net to Sales
11	Automobiles	$3,808	$309,614	1.2%
14	Cotton mills	8,296	116,340	7.1
7	Drugs and sundries	15,706	224,675	7.0
8	Electrical equipment	D–12,051	297,276	D–4.1
14	Food—miscellaneous	21,046	483,670	4.4
17	Iron and steel	D–58,262	839,081	D–6.9
15	Meat packing	19,285	1,290,365	1.5
11	Petroleum	196	547,084	..
8	Rubber	10,942	381,840	2.9
9	Shoes	11,611	171,467	6.8
126	Miscellaneous	28,107	936,216	3.0
240	Totals	$48,684	$5,597,628	0.9%

D—Deficit.
(Data from National City Bank of New York.)

Table V—National Income Produced and Paid Out—1929-1932
(Millions of Dollars)

	1929	1930	1931	1932	Change from 1929 to 1932
Income produced	$83,032	$70,345	$54,643	$39,365	—52.6%
Income paid out	81,136	75,410	63,247	48,894	—39.6
Business savings or loss	+1,896	—5,065	—8,604	—9,529	...

(Department of Commerce.)

Table VI—National Income Paid Out—1929 to 1932
(Millions of Dollars)

Type of Payment	1929 Paid Out	1929 Per Cent of Total	1930 Paid Out	1930 Per Cent of Total	1931 Paid Out	1931 Per Cent of Total	1932 Paid Out	1932 Per Cent of Total	Change from 1929 to 1932
Salaries*	$5,702	7.0	$5,661	7.5	$4,738	7.5	$3,383	6.9	40.6
Wages*	17,179	21.2	14,210	18.8	10,542	16.7	6,840	14.0	60.2
Other salaries and wages	29,052	35.8	27,794	36.8	24,622	38.9	20,302	41.6	30.2
Total labor	$52,793	65.0	$48,582	64.4	$40,896	64.6	$31.533	64.5	40.5
Net div. and int., foreign	$565	0.7	$616	0.8	$536	0.9	$393	0.8	30.4
Dividends	5,964	7.4	5,795	7.7	4,313	6.8	2,588	5.3	56.5
Interest	5,677	7.0	5,815	7.7	5,649	8.9	5,491	11.2	3.3
Total property	$12,206	15.1	$12,226	16.2	$10,498	16.6	$8,472	17.3	30.6
Net rents and royalties	$4,116	5.1	$3,475	4.6	$2,752	4.4	$1,865	3.8	54.6
Entreprenurial withdrawals	12,020	14.8	11,127	14.8	9,102	14.4	7,024	14.4	41.5
Total entrepreneurial income	$16,136	19.9	$14,602	19.4	$11,853	18.8	$8,890	18.2	44.9
Total paid out	$81,136	100.0	$75,410	100.0	$63,247	100.0	$48,894	100.0	39.7

*Selected—Includes mining, manufacturing, construction, steam railroads, Pullman, railway express, water transportation.
(Data from Department of Commerce.)

Table VII—Per Capita Earnings of All Employed Workers

	1929	1930	1931	1932
Earnings	$1,475	$1,448	$1,360	$1,199
Decline from 1929	....	1.8%	7.8%	18.7%
Per cent of 1929 income	100	98.2	92.2	81.3
Cost of living index	100	97.4	88.9	80.4
Change in real income for 1929		+1.0%	+1.4%	+1.0%

(Department of Commerce.)

Table VIII—National Income Produced—1929 to 1932
(Millions of Dollars)

	1929	1930	1931	1932
Income produced	$83,032	$70,345	$54,643	$39,365
Paid to labor	52,793	48,582	40,896	31,533
Per cent of total	63.5%	69.1%	74.8%	80.2%

(Department of Commerce.)

years. Table I showed that corporations in the United States, except tax exempt and life insurance companies, operated with deficits in 1931 and 1932 and had, in the aggregate, not a dollar earned to use for dividend payments. And dividends of less than 1 per cent would have been possible from the profits of 1933.

Payments of interest held up better than any others and there is ample justification for this. The owners of long-term, interest-bearing securities are persons who prefer a lower return on their investments for a promise of safety and certainty of continued return. By this choice they forego the possibility of increased returns during periods of prosperity and do not share in the increased wealth then produced, so it is obviously unfair to expect them to take a full share of the losses of a depression.

Salary Burden Smallest in Large Corporations

The fact that the number of salaried employees and their incomes did not decline as much as did those of wage earners requires an explanation in view of the charges that this condition represents discrimination in favor of those who have, compared with those who have not. Salaried workers generally hold more responsible positions, they are fewer in number and they usually require longer periods of training and experience to equip them for their jobs than do wage earners. Since it is so much harder to replace them than a worker there should be little surprise or criticism because business men have been reluctant to displace or to dissatisfy trained executives and assistants.

Because of recent publicity about the very large salaries and bonuses received by some officers of large corporations, it is interesting to learn, again from information furnished by the Bureau of Internal Revenue, that a considerably smaller proportion of gross income or sales is paid out for salaries in the largest corporations than is paid by small ones. During 1931, 2.4 per cent of the gross sales of all corporations was paid to officers. In corporations with assets of more than one million, the ratio was 1.1 per cent, in small corporations it was 5.1 per cent.

Economic Maladjustment Prolonging the Depression

The evidence cited here indicates that the depression was not caused by

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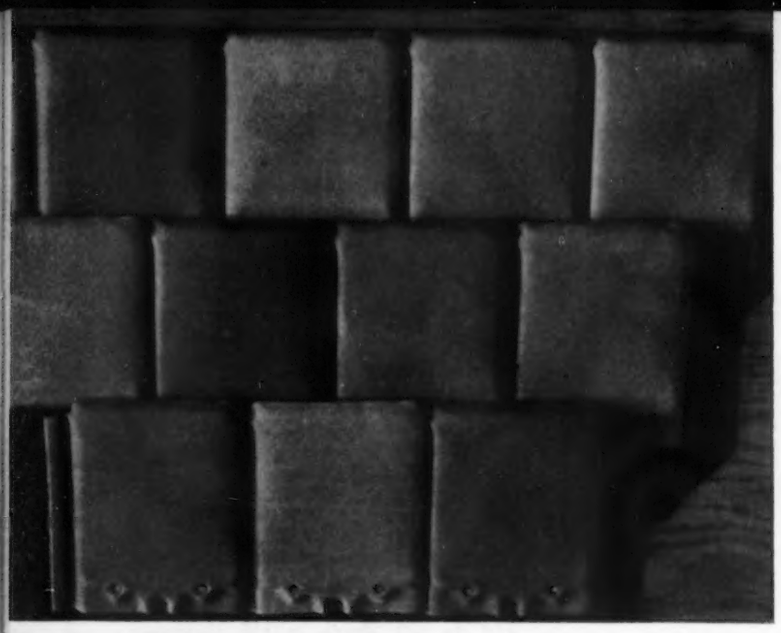


Roof tiling made of 22 ga. steel sheets pressed to form and then coated with porcelain enamel is said to offer architects a permanent and attractive type of construction with no maintenance cost.

Porcelain

ARCHITECTURAL aspects, development and trends of the application of porcelain enameled steel to building construction are dealt with in this article, the second in a comprehensive series on metal enameling developments. Other articles in this series by the same authors were published in THE IRON AGE of June 21 and July 5.

By LeROY W. ALLISON and MALCOLM B. CATLIN

WITH the constant developments and progress in building construction, and the heavy consumption of basic structural products for such purpose in normal times, it is but natural that manufacturers of sheet iron and steel should turn to this important field of activity as a primary outlet for material in the immediate future. Likewise, porcelain enameling interests have been similarly observant of the broad possibilities in this line, responding readify to the vision of the steel mill in giving full cooperation in the development of porcelain enameled sheets for due recognition as a basic construction material of individual merit.

The past few years have shown definite and encouraging advances in this direction. Porcelain enameled steel buildings have emerged from the novelty class to a recognized status in the construction industry. Commercial and residential structures have been erected for actual service or demonstration purposes, showing conclusively that units of this type are well past the experimental stage and are both practical and logical.

The pioneering work has been done. It is now a case of fully perfecting and popularizing buildings of this character. Leading construction interests, apart from the steel mill or porcelain enameling plant, are directing particular attention to the potential possibilities of steel structures of porcelain enamel finish, anticipating a consistent and expanding future growth and public demand for such buildings. This is especially true with construction companies familiar with pre-fabricated design and erection, as the development of the porcelain enameled steel building trends naturally in that direction.

Porcelain enameled steel offers flexible and attractive construction characteristics. This has been demonstrated many times in various ways, as in the case of wall tile, panels and trim for interior service; porcelain enameled areas for exterior treatment on commercial buildings, porcelain enameled shingles, roofing tile and numerous other specialties. From such features of architectural design in enameled steel for decorative purposes, employed with different conventional types of construction, has come the all-steel porcelain enameled structure, first for commercial utility, and more recently for strictly residential use. Building units of this character are now an accepted form of standard construction and unquestionably are destined to become distinctive factors in the building industry in the future.

For Building Exteriors

Enameled sheet steel for building exteriors has many points of particular merit, determined through actual performance. Such type of construction is distinctly economical, comparing favorably in cost with structures of other standard materials of equal ultimate architectural effects. When developed in standardized, pre-fabricated design, the cost to the owner naturally is lessened, and is appreciably lower than conventional buildings of brick, concrete and the like. Erection in the field is easy and rapid, making for further distinct saving in comparison with other structures. Further, there is low cost of maintenance, coupled with guaranteed long life and durability. So much for the cost factor, which has a definite bearing on mass consumption.

All-steel buildings of this character are thoroughly fireproof. They will not burn nor blow down, in the event of hurricanes and wind storms, when properly constructed. They are safe and sanitary. Still another advantage, and an important one, is the wide adaptability and flexibility to

Enameled Steel Buildings

varied treatment in color schemes and decorations—the enameled steel sheet lends itself admirably in this direction in almost unlimited range of possibilities, and exactly in accord with desires of architect or owner. Those responsible for the present perfection of porcelain enameled steel buildings have no hesitancy in advocating such type of construction for the finest structures, whether for commercial or residential use.

The expanding popularity of exterior panel walls has brought about the development and introduction of many types of most diverse materials, ranging from compressed mineral compositions to treated cotton or other fabrics. None of these, however, has attained the results and accomplishments, with corresponding recognition of the advantages of the enameled steel panel, and in the final analysis, the latter material outclasses in many respects any other product for similar service now on the market.

Early Development

It is rather interesting to note that the idea of utilizing porcelain enameled steel for exterior building walls is not of very recent origin. More than 40 years ago, in 1890, to be exact, Herr K. Bergmann of Bergmann's Industriewerke, G.m.b.H., Gaggenau, Germany, was impressed with the architectural possibilities of the material as a result of manufacturing decorative porcelain enameled signs.

To determine the actual merit of the proposed construction, he remodeled his local three-story residence, using enameled shingles for exterior and interior walls. The shingles were formed of flat steel sheets, 4 to 6 mm. in thickness, screwed to wood studs and strips. The result was quite equal to anticipations, so much so that immediately following, Herr Bergmann built a steel summer pavilion on the grounds, similarly covered with porcelain enameled steel shingles. According to a recent technical observation, the shingles have withstood the time and elements without showing the slightest signs of depreciation or failure.

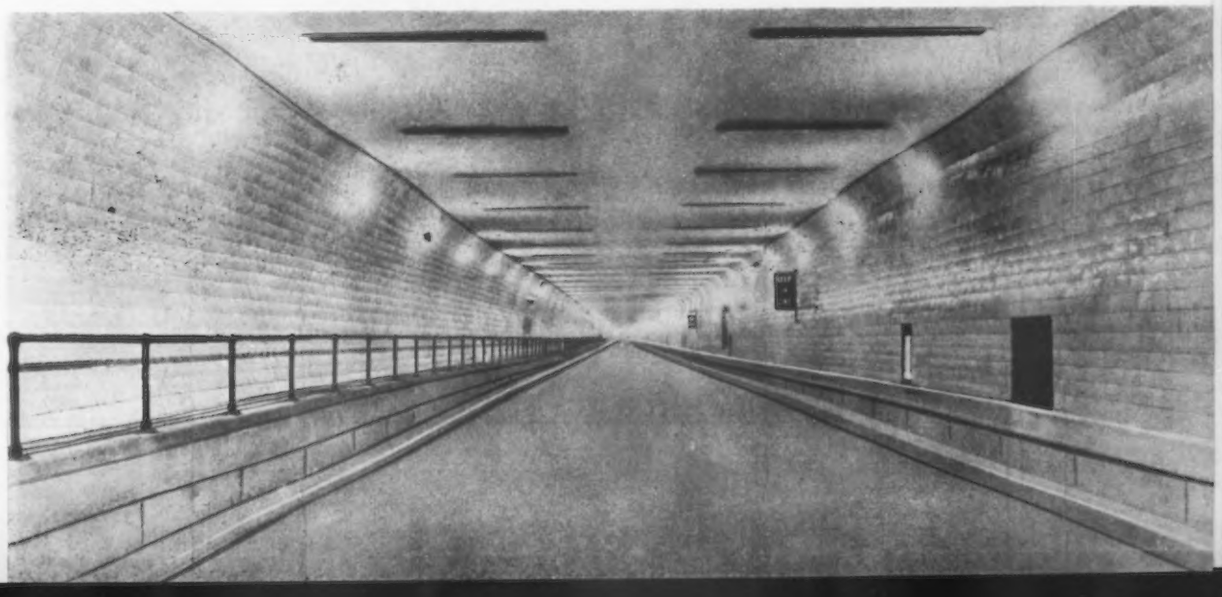
The Bergmann steel shingle development was displayed at the World's Fair in Chicago, 1900, but definite public interest was lacking, attributed to the fact that architecture at that time was concerned largely with elaborate and fancy decorative motifs. These could be reproduced in enameled steel only at excessive or practically prohibitive cost, and the latter evidently proved the barrier to any possible popularity of this material in those earlier years. The one practical outcome of Herr Bergmann's efforts is found in a large three-story residence with numerous exterior ornamental features at Castagniola, Italy, known as the Villa Flursheim.

The architectural trend in recent years to flat surfaces and contrasting colors, coupled with pre-fabrication and other modernization of building construction, has brought the opportunity that sheet iron and steel producers and enamelers have sought. They have been keen to observe this tendency, with resulting notable achievements in their immediate line in a comparatively short space of time.

Commercial Buildings

Porcelain enameled sheet steel exteriors have been finding marked favor for commercial buildings for various kinds of service. What has been accomplished in this direction up to the present time shows conclusively that a large potential market exists for structures of such type. With a resumption of normal or close to normal construction operations, now anticipated in the early future, thousands of tons of sheets will be consumed in this way. Moreover, the architectural possibilities are of exceptional scope in line with different types of commercial building units. This is developing interest among leading architects, who visualize the demand in the future.

The White Castle System of Eating Houses Corporation, Wichita, Kan., operating a chain of quick lunch restaurants, enjoys the distinction of being one of the first, if not the first



The walls of the International Tunnel between Detroit and Ontario are covered with porcelain enameled steel tile.

ABOVE

This is a steel service station, although it doesn't look it. Enameled pressed steel tiles are used for the walls, and Glasiron shingles for the roof.

AT LEFT

This shows a modern service station built with porcelain enameled steel panels by The Austin Co., Cleveland.

BELOW

A boon to the architect engaged in modernizing old buildings is the porcelain enameled steel panel. This shows the use of gun metal blue Glasiron Macotta.

organization to see the practicability of porcelain enameled steel exteriors. A number of years ago, L. W. Ray, construction engineer for the company, was seeking a building material and type of construction that would provide easy and rapid erection, coupled with attractive and distinctive appearance and sanitary advantages, as well as definite stability and long life in constant daily service; further, a known salvage value in event of necessity for removal was an important factor in final selection.

The highly successful use of porcelain enameled iron and steel panels for store interiors, such as markets, delicatessens and the like, came to Mr. Ray's attention, with the result that this material was decided upon for exteriors of White Castle establishments in different parts of the country. Later on, a division of this company was formed under the name of the Porcelain Steel Building Co., more recently known as the Porcelain Steel Builders, Inc., with headquarters at Columbus, Ohio. This unit carries out all construction for the parent organization. Different patented features of standardized building have been devised, including a keylocking system fabricated into the structural framework to hold the enameled panels securely in place.

Marked success has followed this chain of restaurant structures with their porcelain enameled exteriors, supplemented by a definite advertising value through a distinctive, standardized design made possible by the use of this material. Moreover, and not of least importance, the building investment has been minimized to greatest possible extent.

Many other structures of this general type have been built since the White Castle development, including lunch rooms and lunch wagons, gas and automobile service stations, and similar utility buildings. Most of these have followed the same general plan of construction—a frame of steel or wood studding, to which the enameled steel panels are attached with screws or specially designed metal clips. The panels are insulated with layers of felt, mineral wool or other suitable material, and joints filled with flexible mastic.

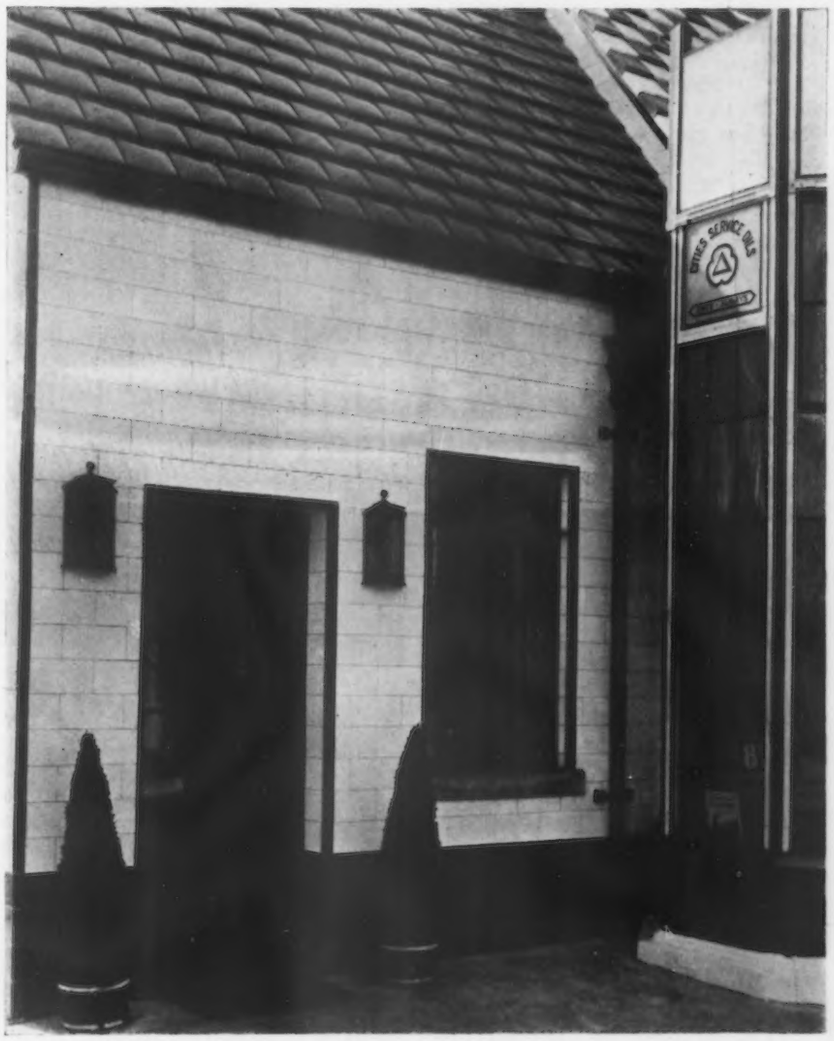
The interior of these buildings, similarly of porcelain enameled sheets, are treated in much the same manner, with the exception that joints are covered with battens of chromium-plated steel or aluminum. By far, the majority of the structures indicate a design and development especially concerned with the advertising and publicity possibilities of porcelain enamel. Thus, they trend noticeably to bright colors and color contrasts, with white a particular favorite, and with special features of construction to win public attention and appeal.

Enameled Steel Service Stations

An expanding and particularly attractive market for porcelain enameled building exteriors is represented by the automobile service station. Whether intended primarily for gasoline and oil supply, or for more extended service and repair business, modern structures of this kind usually give special attention to finished appearance. How will the building look —this is a matter of first importance to secure a unit of striking and appealing character to catch and hold the eye of the motorist.

Attracted by the possibilities of standardized porcelain enameled steel buildings, the Austin Co., Cleveland, prominent in the industrial building field, has given intimate study and attention to units of this type for the past few years. As a result, the company has perfected a system of construction that provides all essential factors of desirable buildings, including cost considerations, with wide range of design and flexibility.

Up to the present time, the work of the Austin organization in this particular field has been concentrated largely on automobile service stations.



Metal tiles with porcelain coating are made to closely resemble the vitrified product.

In the future, it is proposed to expand activities to cover all types of porcelain enameled iron and steel structures for commercial and industrial purposes. Wide use of units of this character is anticipated, where appearance and cleanliness are important factors, including such sizable buildings as required by breweries, bottling plants, dairies, laundries and the like.

The exterior surface of the Austin automobile service station is a solid

face of porcelain enameled sheet steel panels. These are of 18-gage stock, 18 x 24 in., or 24 x 24 in., as the job may require. The framework is of welded steel shapes, pre-fabricated at company shops, with bolted connections on site. The exterior porcelain enameled panels are secured to the steel wall frame by a patented method of construction, providing a neat uniform joint, with no indication of fastening exposed. There are no cracks or crevices to catch dirt or dust. Only an occasional washing is required for continued attractive appearance.

binations are procurable in the porcelain enameled steel panels. White has predominated as a finish for service stations, owing to its attractive, clean appearance and for advertising reasons, with a blending trim and lettering in black, red or green. The sales value of units of this kind is self-evident.

In passing it is interesting to note that for a service station of average size, such as outlined, about 30 tons of steel is used, including framework, sheet steel panels, roof deck, etc. The cost of such a unit is from $3000 to $5000 and upward, depending on

picture further steps in the use of enameled sheet steel for larger building units of commercial and industrial types. When activities in the construction field return in sizable volume, marked developments in this direction can naturally be expected, particularly for those lines of business, as previously noted, that can realize benefit through dominating building exteriors. Even brief analysis shows these in heavy number.

Store Fronts—Interiors

The rapid progress made in recent years in the use of porcelain enameled

The use of a porcelain enamel coating made it possible to cover the entire roof of this attractive residence with sheet steel shingles

The construction outlined is suitable for large or small stations. It is optional with the owner whether porcelain enameled panels are used for the interior wall, or other type of finish, including plaster. Neglecting additional cost, enameled sheets for both wall surfaces make the most desirable result.

The Austin station has given special attention to proper insulation, this being held a highly essential factor for a satisfactory building for constant daily service. A double insulation is provided by means of (1) an insulating board on the back of the porcelain enameled exterior panels and (2) insulating material, preferably rock wool, as a wall filler. Such construction, the company points out, gives more protection against heat and cold than the average brick wall. The wall thickness varies from 3 to 6 in. The roof is formed of long-span metal panels, likewise insulated.

Various interior standardized floor plans are available, all conforming to service station requirements. Liberal window space is provided. As will be understood, any desired color com-

size, as compared with conventional type construction ranging to $20,000 and more. The steel panels have been standardized in the sizes noted for simplicity, ease and economy in handling in the field, tending to hold erection costs to a minimum. Further, such sized panels eliminate conditions of warpage, and if the face of a panel should be damaged in transit or through other cause, replacement is an easy matter. Still another feature pointed out for these service stations is their portable character, with enlargement or removal to another site any time under maximum salvage value.

Another organization active in the erection of porcelain enameled steel service stations is the Louisville Enameled Products Co., Louisville, with numerous examples of its work to be seen in Kentucky and neighboring States. This company has given attention, as well, to the use of porcelain enameled steel in conjunction with conventional construction, securing some particularly attractive architectural effects through such combination.

It requires but little forecasting to

steel sheets for store fronts can be attributed largely to the need for economy in this period and the urgent necessity for building modernization. The problem of many an idle and old-fashioned store has been solved through the construction of a new front. Owners have not been unmindful that prospective tenants are attracted by exterior appearance. Thus the emphasis given to need for modernization and the susceptability of enameled steel for such service have done much to bring this business to the steel mill and the enamel jobbing plant.

This branch of commercial architecture gives many striking examples today of the developments in store front design, with individual treatment to suit the particular character of the establishment. With few structural changes required in buildings, store owners and architects have been attracted by porcelain enameled steel as a material of decidedly worth-while utility for store exteriors, with numerous values procurable in color schemes, appearance, permanency and individuality not to be obtained with

other products on the market under corresponding cost.

Brightly colored enameled panels, strips, bands or as the case might be, in conjunction with chromium-plated steel, copper or other suitable metal, have made for some outstanding results. Practically every large city in the country has exhibits of this work, and for which commercial architecture, itself, is entitled to much credit. Large chain restaurants have been especially prominent in adopting porcelain enameled steel exterior—soft orange shades, trimmed with narrow bands of highly polished bronze; golden orange enameled panels with polished bronze window frames, doors and trim; alternate red enameled steel and bronze bands, these and many other color combinations are being used for porcelain enameled store fronts in metropolitan centers.

Enameled iron and steel has been popular for store interiors for many years and some of the early uses of such material can be traced to this branch of service. Certainly today it is an accepted and preferred material for all classes of retail shops where cleanliness and sanitation are important considerations. Markets, food product stores, lunch rooms and the like are among the natural outlets for enameled sheets in this commercial field. White porcelain enamel, as to be expected, is the leading color in all such establishments.

Display cases, with bases of porcelain enamel, are keeping pace with the progress in interior store work. Some highly attractive designs and effects are being secured in such fixtures, far removed from conventional types, with steel-enameled bases to match expensive and selected wood, such as mahogany, circassion walnut, grained oak, and so on. Store counters, cooler apparatus, refrigerators and similar store equipment have been designed and modernized in porcelain enameled iron and steel to meet the current trend and demand. Porcelain-faced steel shelving is still another item in the broadening range of up-to-date store fixtures, supplemented by enameled steel partitions and tables with tops of such material.

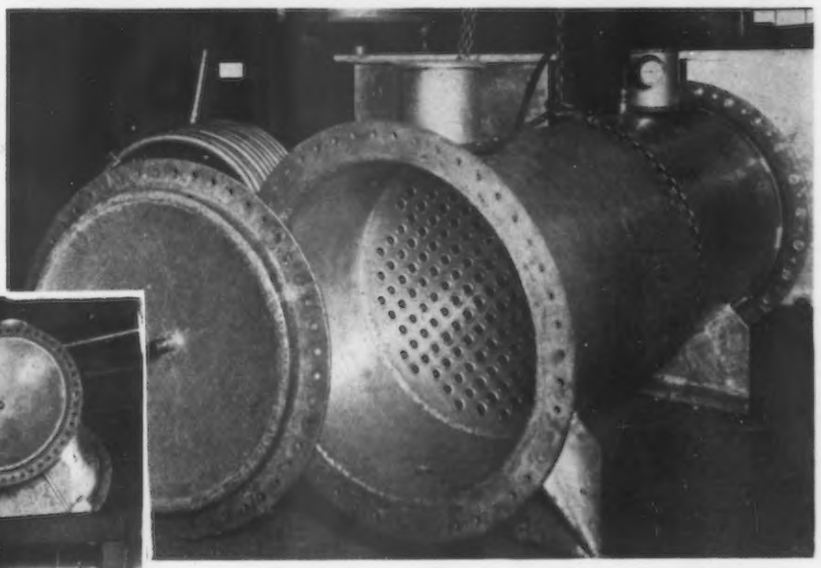
Distillation Equipment Built Of Arc Welded Aluminum

CONSTRUCTION of arc welded aluminum distillation equipment for a new chemical process has been completed by the Thornton Company, Cleveland. The equipment is believed to be the first of the kind ever built and is one of the most involved welded aluminum projects yet reported.

As shown in Fig. 1, the process requires a still connecting with two condensers, below which are two drip tanks and two receiving tanks.

The still, which may be seen to the left in the photograph, is 7 ft. 4 in. high and 3 ft. 6 in. in diameter. It is built of ⅝-in. aluminum welded with one longitudinal seam, the edges of the plate being vee'd out preparatory to welding. The bottom of the still is a dished plate. The top is bolted on by means of 4 x 4¾-in. angles, which are lap welded to the body of the still and to the top. The forming of these heavy angles was a difficult operation.

Inside the still is a 3-in. diameter coil of extra strong aluminum pipe, 15 coils high. The still operates under a 29-in. vacuum.



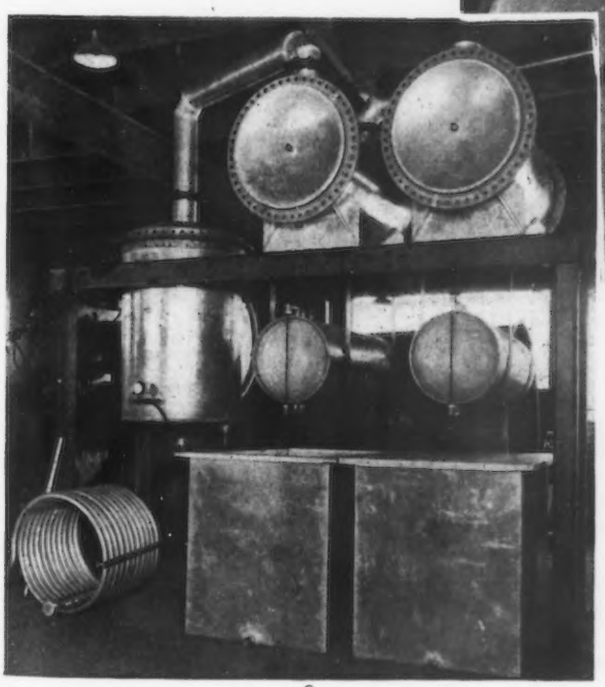


Fig. 1 — (at left): This distilling apparatus represents one of the most involved cases of aluminum welding. Fig. 2 — (above): Condenser supports are also welded on.

The two condensers are exceptionally interesting. They are 8 ft. long and 3 ft. in diameter. The shells and heads are of ⅜-in. plate and the bulkheads of ½-in. One hundred and forty tubes are used in each condenser. No difficulties were experienced in the welding of the condensers despite the heavy plate used. Welds were tested under 100 lb. pressure, with no flaws found in any of the welds. The condensers operate

(Concluded on Page 84)

Accurate Control and Inspection

Slugs of each melt are cast for analysis at various periods as a method of specification control.

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AT the plant of the Timken Steel & Tube Co. all departments concerned with the quality of the steel produced are closely coordinated and work in harmony with the producing departments. Both inspectors and recorders depend upon the laboratory for chemical data and analysis, upon the mill metallurgical department for certain physical data and macro studies, and upon the technical metallurgical department for micro studies and reports as to the grain structure of the product and the balance of the physical data. No shipment can be released until both the chemical and metallurgical departments have made written reports to the effect that specifications have been met.

TO produce steel of consistently uniform high quality requires constant vigilance. Inspection alone is not sufficient. Every detail of production from the scrap pile on through to the shipping platform must be checked physically, chemically and metallurgically. Records must be kept and analyzed, specimens must be examined and tested, slips must be avoided.

Accurate records of the melt shop practice at the Timken plant are maintained by the recording department. Two melt shop department heads check through their melters every step in the production of open-hearth and electric furnace steel. These melters compute the charges, add the alloys at the proper times, watch melting temperatures and conditions, and in conjunction with the recorders, keep a detailed record of every step from the scrap pile through the melting, pouring and stripping operations until the ingots are safely in the soaking pits.

These men call freely upon the chemical laboratory, and a special pneumatic tube system has been installed between the plant and the laboratory to speed up delivery of samples. In conjunction with this a telautograph connects the recorder's office with the laboratory, leaving no possibility of confusion of reports. Every fact is recorded; no verbal misunderstandings or inaccuracies are possible. The heat record sheet alone carries spaces for over 200 entries, not counting space for remarks. Each melter has a work sheet, and a summarized record of heats carries headings for 24 items, taking the ingots from the time they are poured until they are delivered to the soaking pits.

Drillings Delivered by Tube

As soon as a charge is melted in either the open-hearth or electric furnaces a small slug is cast for examination. This is cooled according to specification and drilled, the drillings being sent by tube over to the chemical laboratory for an analysis. This first, or melt, analysis always includes carbon and manganese, and on samples from the electric furnaces phosphorus and sulphur, together with main alloy used in the heat. Again, just before the furnace is slagged off, a second sample is taken and analyzed for carbon and manganese and usually the main alloying element. Other

for Quality Steel Production ▲ ▲ ▲

elements may be checked if requested by the melt shop.

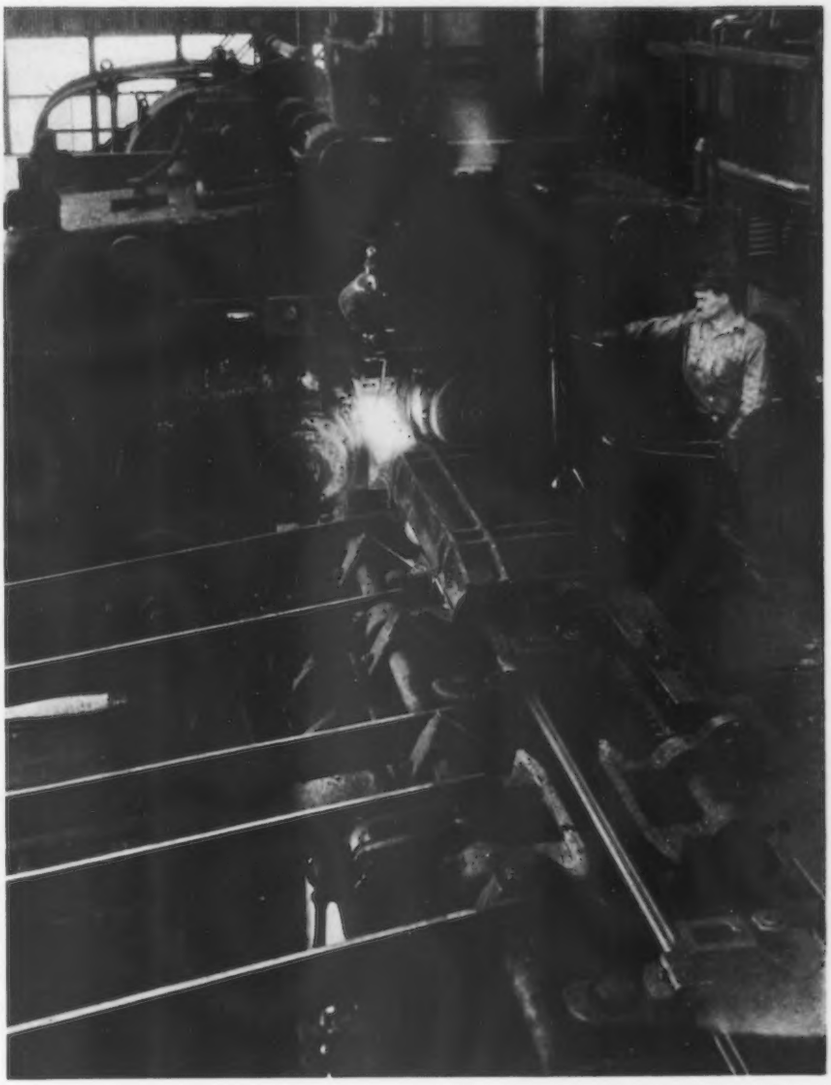
Knowing the fundamental composition of the charge, the melter computes the alloy additions for the mix and as soon as the materials are melted sends another test sample off for analysis. This test is known as a "prelim," and is a control to meet specifications. It may be repeated as often as required to bring the heat to any definite analysis. Again carbon and manganese, together with the main alloy, are checked, and tests made for phosphorus and sulphur if indicated. Standard practice on electric furnace heats is to run a complete analysis at this time. The results are sent to the melt shop by telautograph so that there may be no delay in tapping. When the heat is tapped samples are always taken from top, middle and bottom of the ladle as the steel is teemed into the ingot molds and submitted for complete analysis, inclusive of residual alloys.

Ingots Identified by Numbers

Every element that may bear on the condition of the steel in the ingot is recorded, such as condition of mold surface, bottom plug, temperature, time ingot remains in mold, time stripped, etc. Each ingot is numbered to show its place in the pour, and with this number goes the heat number, both of which carry through the entire processing of every ingot.

The inspection and mill metallurgical departments take charge of the steel as it leaves the ingot soaking pits to go through the 35-in. blooming mill. Here the inspectors cooperate with the rollers regarding size of bloom, etc., see that blooms are properly cropped and that samples are sent to the chemical laboratory for check analysis and to the mill metallurgical department. Each sample is submitted to macro examination and to the Ehn test. At the time these crop samples are taken heat and ingot numbers are stamped on the bloom, together with its cut location.

Following hot cropping all blooms are transferred to the pickling and chipping yard, being cooled en route according to the type of steel, either on racks or in pits. The vast majority of the blooms are pickled and all are carefully inspected for seams, scabs, checks, cracks and surface defects which might affect the quality of subsequent mill operations. Any surface defect is removed by chipping or grinding. Heavy seaming or cracked ends condemn a bloom to scrap rather than an attempt at salvage by heavy chipping. Special lighting arrangements developed by the General Electric Co. in conjunction with Timken engineers to produce uniform high intensive lighting have been installed in the chipping yard to facilitate the work of the inspection staff. Plant records show that less than 1½ man hr. time per ton of steel is required in chipping, which is exceptionally



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An inspector is constantly on duty at the furnace where stock is heated for the piercing mill. He must see that each piece is heated to a temperature suiting its composition.

low considering the types and quality of the steel produced.

Inspection of Blooms

Before entering the reheating furnace, inspectors check the ingot, heat and cut numbers on each bloom and follow the first and last bloom of each heat or order through the mills to the hot bed. Special analysis and special order stock may be checked through by individual bloom when required. Thus the original source of every piece of finished stock can be traced at any time. Samples are cut from the stock as it passes the mill and sent to the chemical and mill metallurgical departments for testing. Material over 2 in. in section is stamped with the heat and ingot number, and smaller stock tied in bundles with metal tags identifying heat and ingot numbers.

Billets which are rolled on the bar mills for piercing or rerolling are all given special inspection for surface defects and are conditioned by chipping or grinding before advancing through further operations. Where necessary, and whenever specified, bar stock is pickled before inspecting and conditioning. When such stock again advances through the mill it is checked by the inspectors and identified as to heat and ingot numbers.

Samples of bar or finished stock sent to the metallurgical department are fully tested for physical properties. In addition to the Ehn test finished stock samples are frequently micrographed. Physical tests on solid stock comprise: Ultimate strength, elastic limit, percent elongation, reduction of area, Brinell hardness and Izod or Charpy test strength. Tubing is also tested for flange or flare resistance, bending strength, crushing and hydrostatic pressure, as well as cold expansion resistance.

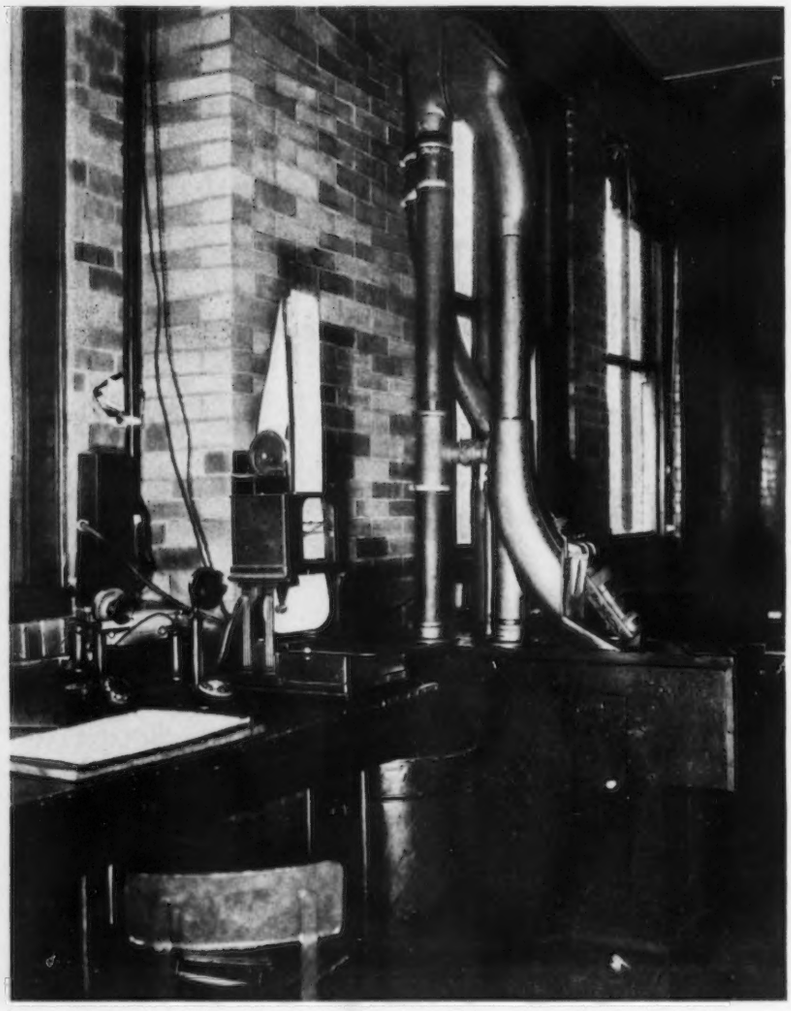
Inspector Cooperates With Roller

Part of the mill inspector's function is close cooperation with the head roller as to section and condition, warning him whenever Timken tolerance limits are approached or surface condition is not up to standard. In these matters Timken standards are particularly rigid, for much of the steel produced in the mill is used directly by the Timken Roller Bearing Co., where finishing requirements are severe.

Inspection practice on hot rolled seamless tubing is similar to that for solid stock, but is more detailed because of the necessity for examining both inner and outer surfaces, check I.D. and wall thickness as well as length and O.D. One inspector is constantly on duty at the furnace where stock is heated for the piercing mill.

He must see to it that every piece of stock is uniformly heated to the proper temperature, and that differs for various alloys. The mill foreman, or roller, is responsible for the condition of the tube as it comes from the piercing mill, from which it passes directly to a reheating furnace. After leaving the finishing mill the tubes all pass a pair of inspectors, who examine both inner and outer surface for defects, check O.D., I.D. and wall thickness. Special facilities are provided for this work. Samples approximately 1 ft. in length are cropped by hot saws at the upper ends of the cooling rack and sent to the mill metallurgical department for examination and test. When certain types of alloy are being rolled, and on special orders, even greater precautions are used by mill operators and inspectors, but routine practice keeps the Timken standard above average at all times.

The heat treatment and finishing processes through which tube material must pass after leaving the rolls depend of course upon the type of alloy and upon the customer's specifications. After finishing operations all tubes pass through the final inspection department. Here every piece of stock is closely examined for interior and exterior surface defects, size (I.D. and O.D.) wall thicknesses and length, and in some instances another set of samples is furnished to the metallurgical department for final test. Facilities are available for removing minor surface blemishes such as scale marks by grinding. No order is released for shipment until both the chemical and metallurgical departments have completed their tests and certified that the material not only meets the customer's specifications, but also that it meets the Timken standard for quality and suitability for intended use. Just as is the case in solid stock, each shipment of tubes is identified so that the complete history of every piece of stock



Verbal reports "don't go" because of the likelihood of misunderstanding. A telautograph system connects the various departments. Samples for analysis reach the laboratory via pneumatic tube.

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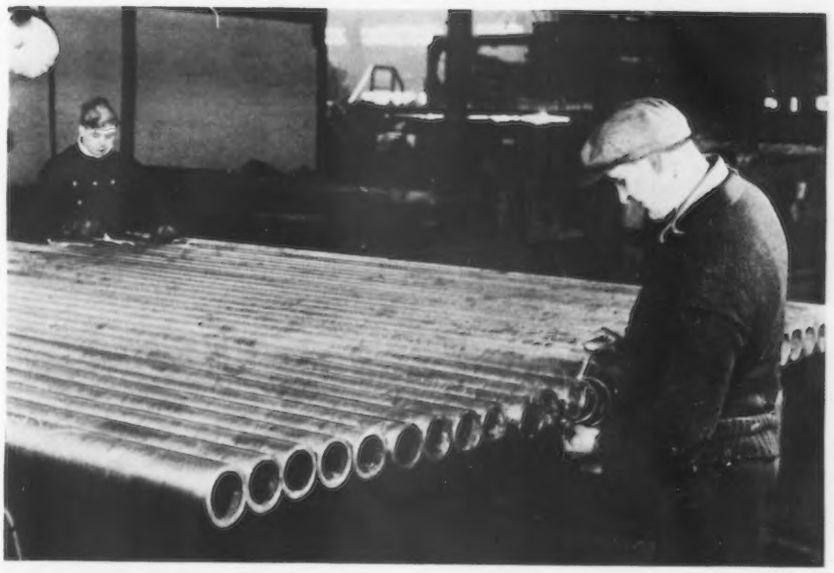
is readily available for study at any time.

Precautions in Cold Drawing

Stock for cold drawing, both solid and tube, after pointing and preparation for drawing, is pickled and carefully inspected and conditioned by grinding if necessary, so that only perfect stock enters the dies. The cold draw operators then assume responsibility for maintaining a satisfactory surface, but before shipment the final inspection department, the chemical and metallurgical departments, must all give the material clearance.

Close attention is given to the type of men added to the inspection staff. New men start as helpers and learn their work by experience, being trained as specialists for different types of stock and different alloys, for what may be a minor defect in certain cases may be cause for rejection in other instances. The other departments cooperate in developing these men so that they will have an understanding of the uses to which stock will be put. This improves the morale of the staff and insures a better understanding between the steelmaker and the consumer, for when special precautions are indicated by a knowledge of the class of work to be performed by or on the stock, it becomes natural to give it even without the definite instructions which always accompany each order through the plant.



ABOVE

After finishing, all tubes pass through the final inspection department and receive physical inspection as well as chemical and metallurgical tests.

AT LEFT

Each ingot is numbered and the number is given to blooms and billets, identifying the final product with the ingot from which it came.

Close cooperation between all departments—melting, production, inspection, testing and analytical—must be and is maintained at all times, for every man in the plant realizes that only by close attention to even the smallest details can quality steel be produced under commercial conditions.

Sound scientific metallurgical development brings new alloys into the realm of commercial possibility. To transfer these to industrial use is the function of the plant, and to this end all cooperate in maintaining the reputation of the company for shipping only quality steel suited for its destined use, and shipping it on time. Quality comes first, and under the rigid requirements at the Timken plant has become a habit. As a result, it does not interfere with production. Large shipments are just as carefully followed through the plant as small orders, and the full history of every piece is indicated by its shipping tag.

Complete records of all details are on file in several departments so that experience may be drawn upon in determining subsequent melting practice, rolling procedure, proper heat treatment, etc., which will still further improve the quality and extend the uses of Timken alloy steels and seamless steel tubing.

Metals Group To Award Achievement Medal

THE trustees of the American Society for Metals have voted to establish an achievement medal for the recognition of metallurgical achievement which has stimulated work along similar lines and contributed to advances in metallurgical knowledge. In recognition of Dr. Albert Sauveur's eminent contributions to the science of metallurgy, it was voted that the medal be named in his honor, and it will be known as the Albert Sauveur Achievement Medal.

As a tribute to Dr. Sauveur, who is Gordon McKay professor of mining and metallurgy at Harvard University, he will receive the first medal at the annual banquet of the American Society for Metals at Hotel Pennsylvania, New York, Oct. 4.

Alloys Play In

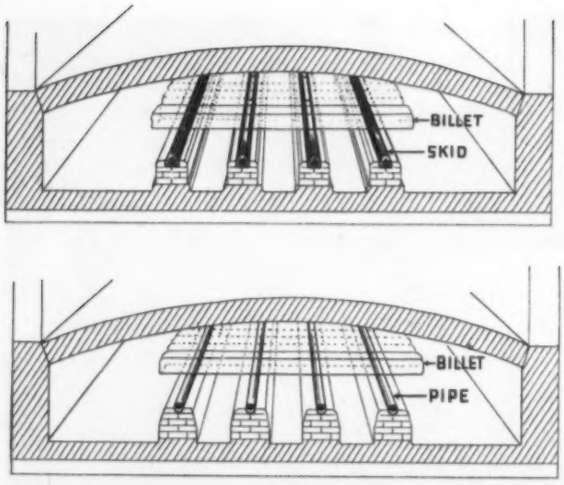


Fig. 1—Sketches showing old and new skid installations for continuous furnaces. Those shown below are the old type of water cooled pipes as compared with alloy skids, above, which are wear resistant up to 2000 deg. F.

Fig. 2—Alloy skids for use in a rail mill heating furnace.

Fig. 3—A conveyor assembly consisting of hollow shafts with disks keyed and welded in place.

THE purpose of this article is to describe some of the more widely used methods of conveying materials through furnaces and the requirements of alloys used in this connection. The conveying methods will be classified as to the heating operation and the type of product to be carried through the furnace, such as (a) heating furnaces (for billets, slabs and bars), (b) normalizing furnaces (for sheets, plates, strips and tubes), (c) reheating furnaces (for plates and bars), and (d) annealing, hardening and tempering furnaces (for bars, rods, forgings, small parts, and special heating requirements).

In building continuous furnaces [class (a) above] for heating billets, slabs and bars before rolling, the general practice has been to supply some variety of skid on which to slide the stock through the furnace. The stock is charged at the end of the furnace farthest from the burners and is pushed along the skids toward the discharge end. The skid is used inasmuch as it may be easily removed after it is worn down and replaced with a new one. Otherwise the refractory bottom would wear down quickly and unevenly and would present a very unsatisfactory surface on which to slide the stock as well as entail expensive and time-consuming repairs. The skids used have ordinarily been cast iron which was non-cooled, or extra heavy steel pipe which was water cooled.

A cast iron skid in a hot zone is unsatisfactory because at the higher temperatures it is very soft and it is sloughed off to some extent by the heavy stock passing over it. Even in the cooler zones it is affected by wear and requires replacement about twice a year.

Water-cooled pipe skids are considered unsatisfactory because they lower the temperatures along the furnace bottom, and they also cut down the output by requiring a longer time for the stock to "soak." The water-cooled pipe lasts some time longer than the cast iron skids but

Important Part in Furnace Conveyors

By M. K. MELLOTT

presents another objectionable feature in that the stock where it comes in contact with the pipe is not properly heated or has what is commonly called "black spot." Unless the black spot is removed by long soaking on a refractory hearth it may cause breaking of the rolls or deformation of the structure of the steel in rolling which may later give trouble. Conventional water-cooled pipe skids are shown in Fig. 1 as compared with the newer type of alloy steel skids.

Alloy skids, as illustrated in Fig. 1, eliminate the black spot of water-cooled pipes and make possible a shorter "hot hearth" as the steel being heated will be at a fairly uniform temperature throughout its section. The alloy skids in any heat zone will also be harder than the steel and will resist wear to the extent of outlasting cast iron. The alloy skid, due to its greater strength, may be made much lighter in cross-section than cast iron. This fact is also a major factor in balancing the cost of the metals.

In addition to the proved longer life and more uniform results, alloy skids are good to 2000 deg. even in the presence of high sulphur content. When semi-cooled they have been operated at a maximum temperature of 2400 deg. In Fig. 2 there are shown several sections of nickel-chrome steel skids for a rail mill heating furnace.

One user of alloy skids in a slab heating furnace reports that the alloy skids afford ten times the life at approximately eight times the cost of cast steel skids. When the elimination of shutdowns is considered the saving is much greater.

Billet and slab heating furnaces are of the combustion type, using almost every type of fuel, and the alloy skids are subjected to a combination of high temperature deterioration and abrasion as well as exposure to gases containing injurious sulphur in varying amounts. To secure maximum service under such conditions it is essential to accurately inform the alloy foundry of the kind of fuel and sulphur content which will be used so that it can formulate an alloy that will offer maximum resistance to these elements.

Normalizing furnaces [section (b) of introduction] are used to heat-treat sheets, plates, strips, tubes, etc. There are several methods in general use for carrying the product through such furnaces.

One of the most common methods of carrying sheets through normalizing furnaces is the use of shafts, with and without disks. These include dry shafts, wet insulated shafts and insulated shafts.

Several improvements have been made in water-cooled shafts to overcome some of the objections of the earlier designs, which were unsatisfactory because of the great heat losses, non-uniformity of heating and mechanical difficulties. One of the improvements consists of insulating the disk from the shaft by having the hub of the disk contact with the shaft only at designated points and filling the space between the hub and shaft with insulating material. Thus the amount of heat conducted from the hot disk to the water-cooled shaft is reduced.

The most advanced step in hollow shaft conveyors is the hollow dry shaft and disk type, as illustrated in Fig. 3. One of the difficulties often encountered, that of "scratching" the

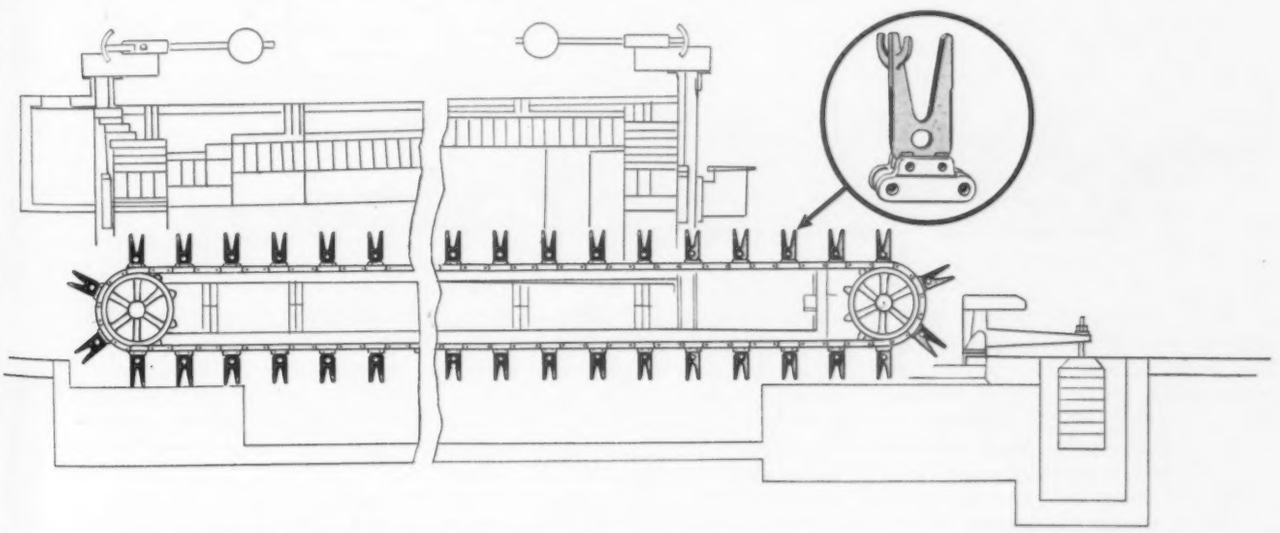


Fig. 4—Alloy steel fingers in the insert. This view shows how they are fastened to the continuous conveyor chain assembly.

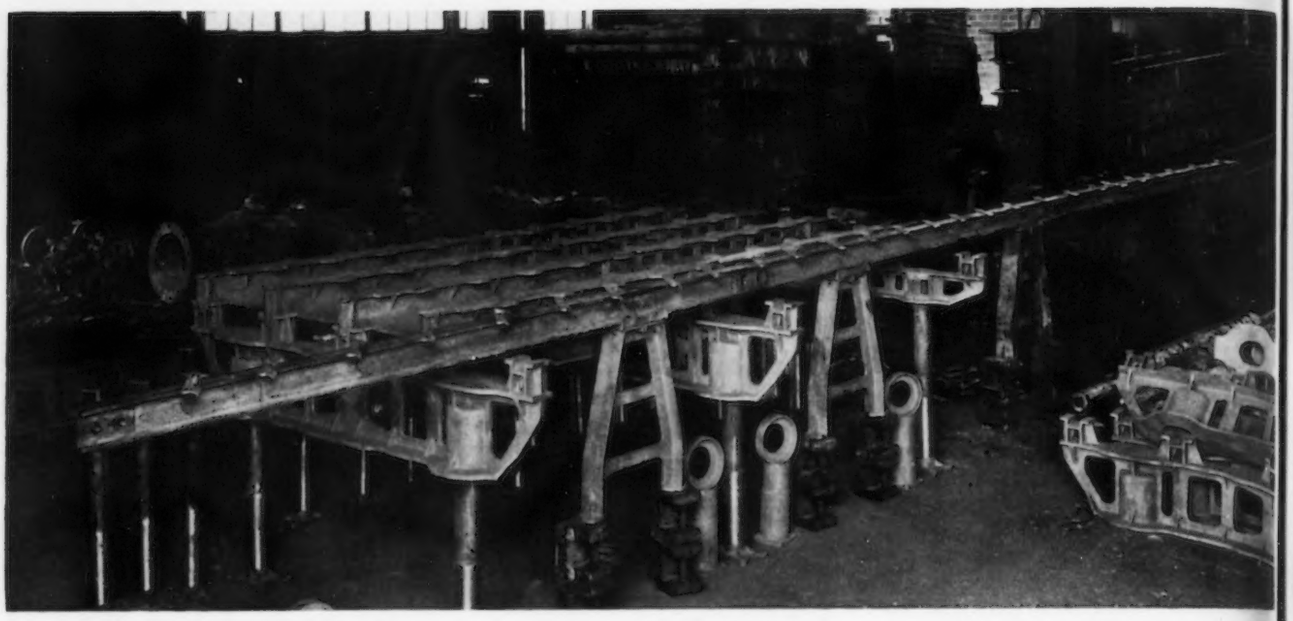


Fig. 5—Partial assembly of alloy parts for a walking beam conveyor which will operate in a furnace at 1900 deg. F.

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sheet due to movement of disks, is overcome by the unique rigid assemblage. The disk is locked on the shaft by casting keys integral to the shaft, and passing a specially designed disk over the keys, turning the disk and driving it on to the keys. The disk is then spot welded into place to insure no movement.

On rotating the shafts by means of sprocket and chain on the outside of the furnace, the sheets can be transported through the different temperature zones at any predetermined speed.

Another method of carrying sheets through the furnace is by the use of alloy carrier blades or alloy fingers, as they are sometimes called, as shown in the insert of Fig. 4. These blades are fastened to a continuous chain and drawn through a slot in the furnace hearth, as shown in Fig. 4. The sheets are placed on the legs of these blades and transported through the entire length of the furnace.

It will be noted that the carrier blades or fingers are bolted to conveyor chains which travel beneath the hearth and are thus protected from the direct furnace heat. In such furnaces a standard link chain may be used but when the furnace design is such that the chain must travel through the heating chamber, it is necessary to use a heat resisting alloy.

Carrier blades or fingers are made of alloy steel. A large manufacturer of steel sheets who has several furnaces of the chain conveyor type has conducted extensive tests on carrier blades. Out of the 12 different alloys made and recommended by separate manufacturers, only one type of alloy blade was in service at the end of one year. Conditions were very severe because the temperature was as high as 2100 deg. F., and the fuel was a producer gas made from a high-sulphur coal. Also it must be remembered that the blades were alternately heated and cooled as they passed in and out of the furnace. The failures that occurred were attributed about equally to oxidation, deterioration due to sulphur attack, and brittleness.

Alloy blades or fingers are designed according to the load requirements and the type of product being treated, such as in pair heating, pack heating and normalizing furnaces. The blades for pair heating furnaces are heavy in order to handle the pair bars; the blades for pack heating are lighter

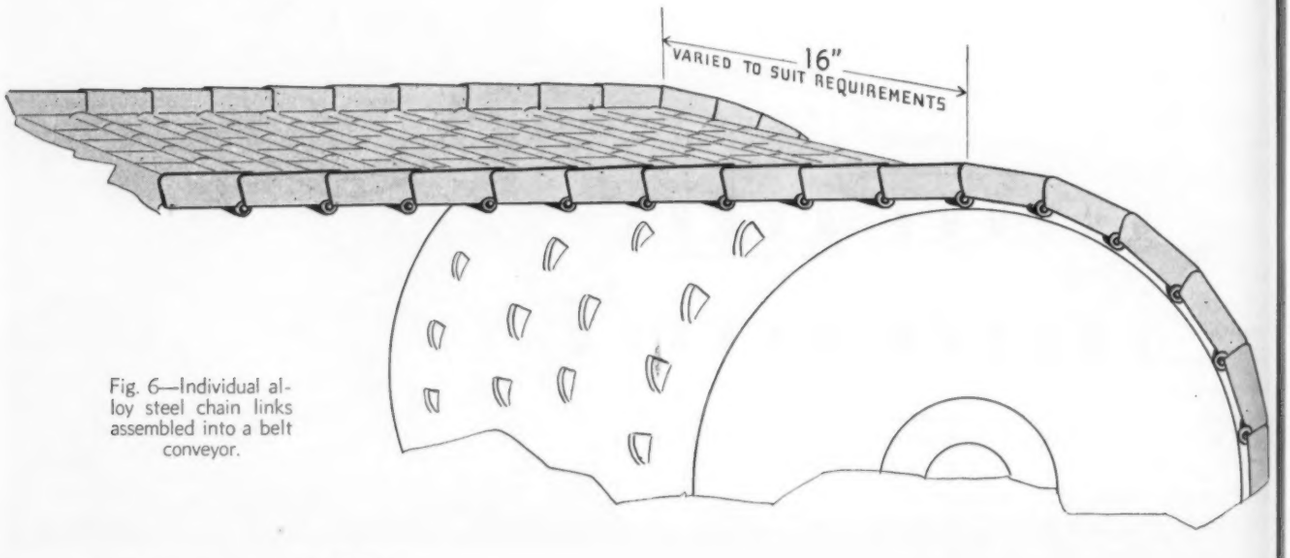


Fig. 6—Individual alloy steel chain links assembled into a belt conveyor.

while those used for normalizing are wider in order to spread out points of support and avoid distortion of the thinner sheet. The temperature requirements range from 1500 to 1900 deg. F. for this group of furnaces.

Walking beam conveyors, also known as rocker bar conveyors, have been used successfully in normalizing furnaces as well as in furnaces for other heat treating operations. This type of conveyor consists of a number of rails extending through the entire length of the furnace hearth and sufficiently beyond each end of the furnace to facilitate loading and unloading of the product being treated. Alternate rails are mounted separately, and movement of the material is secured by imparting motion either to both sets of rails or to one set only and having the other set remain stationary.

When one set of rails is stationary, the other set has either a circular or elliptical motion imparted to it, the movable rails being elevated as far above the stationary rails on the forward motion as they are depressed below the hearth level on the return motion. During the forward motion the material is lifted and moved forward, while during the return motion the material rests on the stationary rails.

When both rails are movable, one set of rails, known as lifter rails, has vertical and horizontal motion and the others, known as slide rails, have only a horizontal motion. The slide rails move the load forward while the lifter rails are depressed below the hearth. At the end of the forward stroke of the slide rails, the load is elevated above the hearth level by the lifter rails to permit return motion of the slide rails. By repeating this cycle the furnace charge is progressively moved through the heating chamber.

Cleats, which consist of bars with hook-shaped ends, may be fastened diagonally on top of the slider beams to reduce the contact area with the sheets and to eliminate slipping. Fig. 5 shows a partial assembly of one design of walking beam.

Normalizing is carried out at temperatures as high as 2000 deg. F. In most cases the combustion type of furnace is used. For this reason the kind of fuel must be known, and also the amount of sulphur present, in order to select the alloy that will give the best service under these conditions.

For annealing, hardening and tempering furnaces [class (d) in introduction] a wide variety of conveyors is used for carrying the product through the heating chamber. Although some products require a specially built conveyor, many products can be hand-led equally well by any one of several designs, depending upon the production requirements and other operating conditions. Some of the conveying methods, the products treated and operating requirements will now be considered. The order of listing is not to be construed as the order of importance.

Belt conveyors are made in three types—sheet belt, woven belt and link belt—and are used in both gas and electric furnaces. Such conveyors are extensively used by manufacturers of nuts, bolts and other small parts requiring heat treatment at temperatures in the range of 1500 to 1700 deg. F.

The handling of the product is usually simplified by feeding parts on to the belt from a hopper which spreads a uniform layer over the entire width of the belt. Stationary side guards of alloy steel are used with sheet belts to prevent the material from rolling off. In the case of woven and link belts, the side guards are a part of the belt.

The individual alloy links and the method of assembly can be clearly seen in Fig. 6.

For heat-treating parts such as plates, forgings and rods, it is often desirable to use parallel chain conveyors of alloy steel, which move through the heating chamber in alloy channel bars or on rollers. Such chains are sometimes provided with knobs or bosses on which the plates rest, or they are of some other special design, or have fixtures fastened to

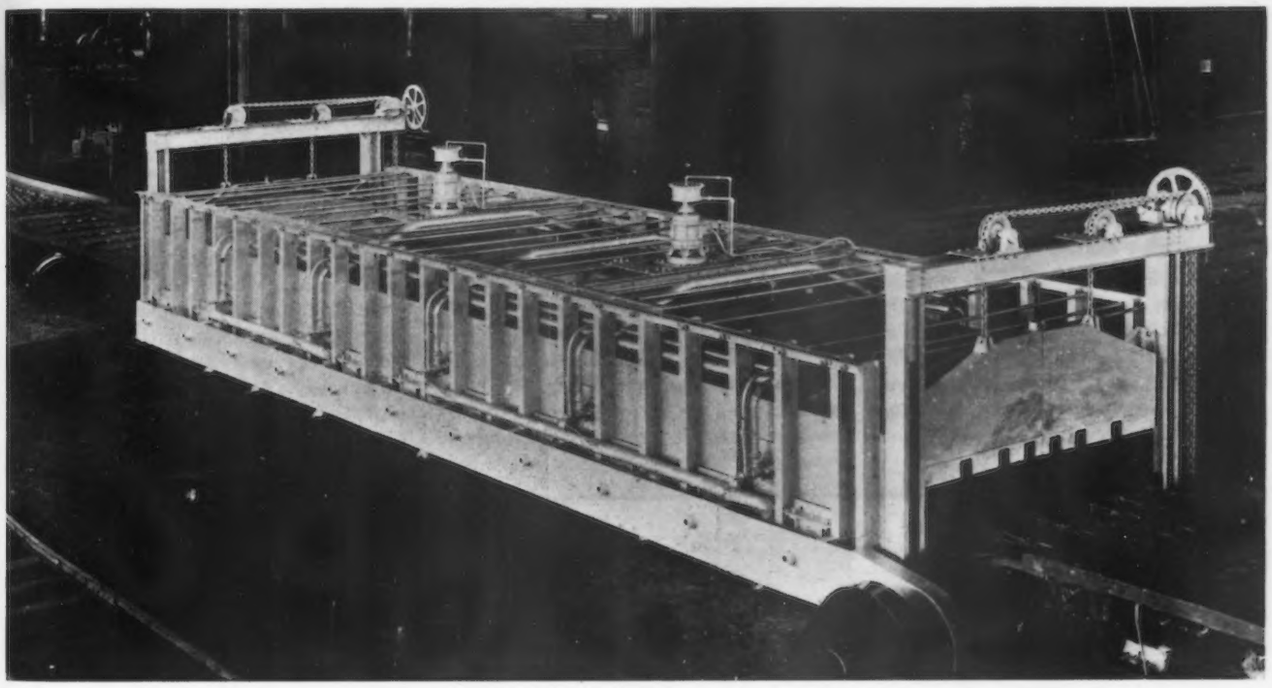


Fig. 7—Specially constructed reheating furnace for 120-in. plates. Details of the assembly are shown in Fig. 8.

carry bars or long irregular parts. Belt and chain-type conveyors are built as light as is consistent with the load requirements, and the return side of the conveyor is kept within an inclosed chamber beneath the furnace in order to conserve as much heat as possible.

To equalize the load on the chain in a long furnace it is desirable to have driving sprockets at both ends of the furnace, but for shorter furnaces the driving sprockets are generally on the unloading end. An adjusting mechanism is provided at the loading end of the furnace to take up the increased length caused by heat expansion of the chain. A counterweight or spring mechanism is more satisfactory than a positive screw or ratchet adjustment for maintaining constant tension without overstraining the chain under any conditions of operation.

Fig. 7 shows a plate reheating furnace for a 120-in. mill, equipped with conveyor chain which is supported in the furnace by alloy dry shafts. Details of the construction are shown in Fig. 8.

The variety of designs of pusher-type conveyors is so great and the types of product treated are so numerous that the few descriptions which follow can hardly be representative of the great amount of development on this class of equipment.

In general, pusher-type methods range from the simple method of sliding the product over a pair of alloy skids to the more elaborate arrangement where the product is carried on specially designed carriers, shoes, or trays, which are automatically fed with material, pushed through the furnace, the charge ejected, and the carriers returned to the loading end without manual assistance.

No difficulty is ordinarily experienced in pushing relatively long bars of rectangular cross-section over a pair of parallel skids, but when the product has an irregular cross-section, such as automobile front axles or rear axles, it is necessary to use a fixture to carry the part. Sometimes a fixture of inverted T-section is used. The flange of the inverted T fits into a T-slot and the top of the web is recessed so as to accommodate the bar. Provision may be made for several recesses so that a number of bars may be carried on one fixture.

At the loading end the parts and fixtures are usually handled manually, as they are at the unloading end, but occasionally provision is made for automatic quenching and return of fixtures by a conveyor.

For products such as automobile bumper springs and other flat bars, carriers consisting of hollow cylinders which travel in channel rails may be used for carrying the product. The carriers may be handled either manually or automatically. In one design a return channel is located directly beneath the load-carrying channel rail, and a transfer mechanism is used to lower the cylinders at the exit end of the furnace and to elevate them from the return channel to the load-carrying channel at the entrance end of the furnace.

For the treatment of iron castings or steel forgings of irregular shape or where the parts are fairly large but in assorted sizes, the product may be carried through the furnace on alloy trays similar to those shown in Fig. 9. Such trays are usually provided with two channel grooves to serve as a guide in sliding over alloy rails on the hearth. Trays of various designs have been made—some with a solid bottom, others with perforations of various sizes, still others with provisions for attaching fixtures on which to hang the parts. Sometimes irregular parts may be held in upright position by inserting them in holes in the trays.

In shops where the products vary considerably, a single furnace is sometimes provided with trays of several sizes and shapes to most economically handle the parts being treated. The width of the trays for any one furnace must be kept uni-

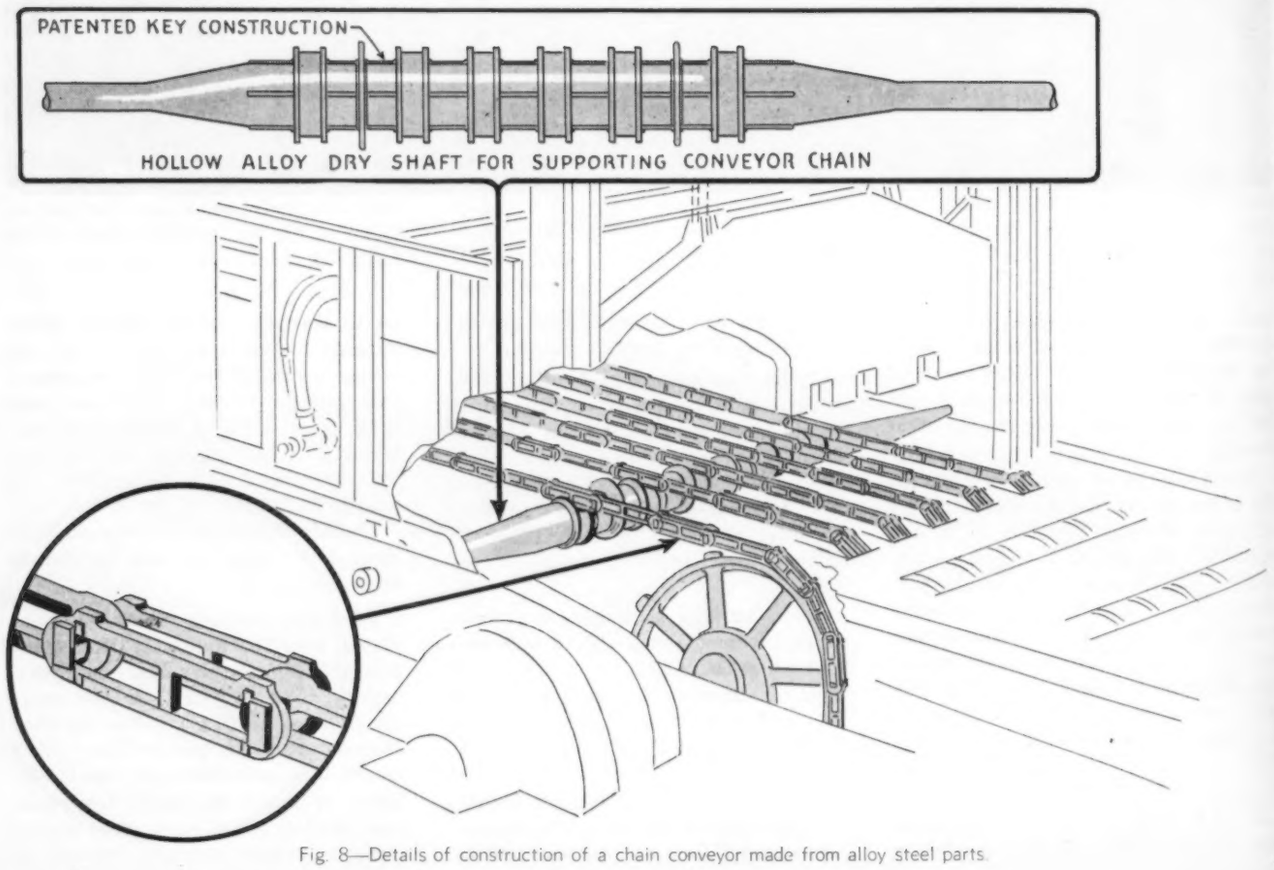


Fig. 8—Details of construction of a chain conveyor made from alloy steel parts

Fig. 9—Alloy steel trays for heat treating castings or forgings of assorted sizes and irregular shapes.

form, but the length and other features of the top may be varied to suit. Regardless of the design of the trays, the one object always in mind, when considering economy of operation, is to make the trays as light as possible yet strong enough to withstand the service and of such design that warping is reduced to a minimum.

In circular furnaces the product may be carried on a rotary hearth or suspended from an overhead conveyor.

Rotary hearth furnaces are being used for almost every known heat-treating operation, including carburizing, annealing, hardening, tempering, heating for forging, porcelain enameling, and glass annealing. Each product requires its own particular treatment and production requirements differ in various plants. All of these requirements have a bearing on the design of the conveyor, which in this case consists of the rotary hearth.

Alloy hearth plates, alloy crossbars, alloy fixtures or alloy pans fastened to hinges securely attached to the hearth frame, serve for carrying the charge. Although most furnaces are charged manually, according to a predetermined schedule, some furnaces are equipped for fully automatic charging and discharging.

In the tilting pan-type furnace, a charge consisting of a quantity of small parts or one larger part is placed in the pan through an opening at one side of the furnace. The product is carried through the heating cycle, and when the position opposite the discharge chute is reached the pan is tilted and the material is then discharged into the quenching bath or bin.

There are many other conveyor designs which have been proved by actual service to be very satisfactory, including the shaker hearth, drum-type conveyors of the smooth and ribbed type, the slot type such as for bolt heating, the overhead monorail, the single chain conveyor, the vertical feed, the cylindrical roller hearth and numerous others. Many of these are modifications of the general types described; others are in a class by themselves. However, each design has its place in industry, but the most satisfactory service can be expected only when the proper alloys to suit the operating conditions are used.

Editor's Note—Some of the designs illustrated in this article are covered by patents owned by National Alloy Steel Co., or other concerns. Photographs, drawings and data for this article were furnished through the courtesy of National Alloy Steel Co., subsidiary of Blaw-Knox Co., Pittsburgh, which made all of the alloy castings illustrated.

July Employment Drop More than Seasonal

EMPLOYMENT, hours of work and average weekly earnings declined more than seasonally in July, according to the monthly report of the National Industrial Conference Board. The number of wage earners employed decreased 2.9 per cent, total man-hours worked declined 6.5 per cent, and there was a decrease in payrolls of 6.5 per cent.

Average hourly earnings in July, at 58.7c., were only 0.1c. higher than in June, but average weekly earnings were 78c. lower because of a reduction in hours worked. Weekly earnings declined from $20.70 in June to $19.92 in July, or 3.8 per cent, while hours worked per week declined from 35.4 in June to 34.1 in July, or 3.7 per cent. Real weekly earnings, however, decreased 4.1 per cent, as compared with a decrease of 3.8 per cent in actual weekly earnings, because of a rise of 0.4 per cent in the industrial wage earner's cost of living.

In comparison with July, 1933, employment, payrolls and weekly earnings in July, 1934, were 15.6 per cent, 19.1 per cent and 3.0 per cent higher respectively, but real weekly earnings were 2.1 per cent lower, because the rise in the cost of living since a year ago has exceeded the gain in earnings.

Manufacturing activity, as measured by total man-hours worked, declined 6.5 per cent from June, 1934, to July, 1934, to a level of 8.2 per cent under that of July, 1933. Man-hours worked declined from June to July in 18 of 25 industries covered in the board's survey, the declines ranging from 0.3 per cent in leather tanning to 37.3 per cent in the iron and steel industry. In nine of the industries the reduction in total man-hours was more than 6 per cent. On the other hand, in seven industries total man-hours increased, as follows: In the paper and pulp, 0.4 per cent; chemical, 2.6 per cent; electrical manufacturing, 3.4 per cent; boot and shoe, 4.3 per cent; book and job printing, 5.1 per cent; furniture, 7.2 per cent; and meat packing, 10.6 per cent. The increases in these industries were contrary to usual seasonal movements in three industries and larger than the normally expected rise in the other four industries.

Oil Circuit Breaker Given 10,000 C

By L. S. HOBSON and H. L. BYRD
Switchgear Division, General Electric Co., Philadelphia

RESEARCH has afforded many advancements in the science of circuit interruption within the last few years. Some of the improvements have been utilized in an oil circuit breaker especially designed to meet the requirements for rolling mill motor control. To prove the efficiency of the design, some unusually severe tests were carried out on a standard form of the breaker of 600 amp. capacity.

The novel and most interesting feature of the breaker lies in the contact construction designed to obtain a large number of operations without maintenance. The main contacts are of the commonly used wedge type. The renewable arcing contacts of the butt type are of unusually massive construction to take care of repeated arcing.

Each of these contacts is 2⅝ x 2⅞ x 1 in., presenting a contact surface of approximately 7 sq. in. and a cubical content of approximately 7 cu. in., thus affording a large active arcing surface and a high thermal absorption capacity. As repeated operations and arcing occur, contact burning takes place over the entire contact surface and as much as ½ in. of material may be lost before any maintenance is necessary.

The contacts automatically adjust themselves for the part burned off, and sufficient pressure between contacts is always maintained. This positive pressure is assured at all values of current by the use of heavy compression springs behind the stationary arcing contacts. They are so located as to be protected from excessive heating, which might impair their strength.

The arrangement of contact parts is such that the magnetic forces set up by the current tend to increase this pressure between the contacts. This is important because, when closing a breaker on heavy current, there may be a tendency of the magnetic forces to separate contacts and cause burning.

Great care is exercised to secure precise guiding of the contacts during their "wipe" in order to eliminate the unnecessary destruction which accompanies "scrubbing" action between high current contacts.

The long arcing tip shown at one side of the stationary contact is used in the control of the pressure-forming arc in connection with the oil blast action.

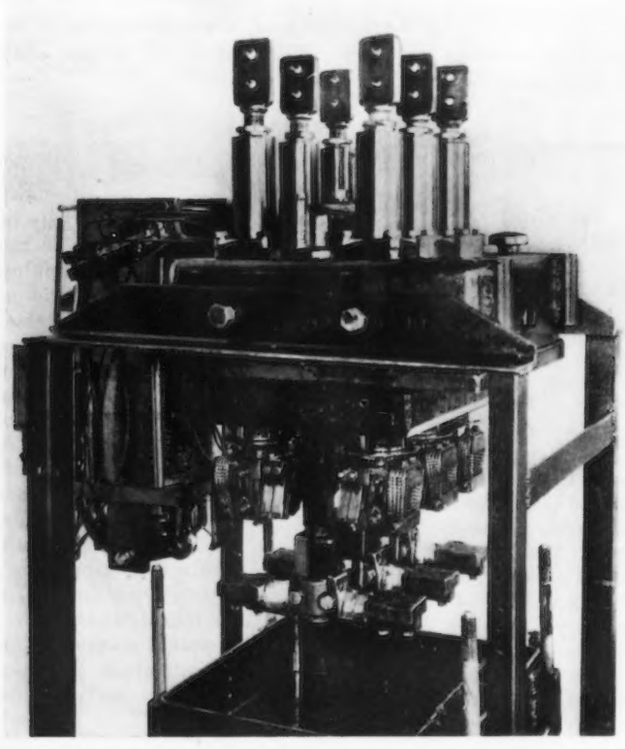
Tests were made in the order given:

(1) 10,689 (open-close-open) operations at 1-min. intervals at 1200 amp., 2300 volts, three-phase, low-power factor.

(2) High potential test well within requirements of the American Institute of Electrical Engineers.

(3) Heat run at rated current (60 cycles), during which no part exceeded the temperature requirements established by the A.I.E.E. standards.

(4) Short-time test of 60,000 amp. for one second.



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A 600-amp. breaker after 10,689 operating cycles, each consisting of a closing and then an opening at 1200 amp., 2300 volts, three phase. The oil tank is shown in its lowered position, though the port holes for oil blast action cannot be seen.

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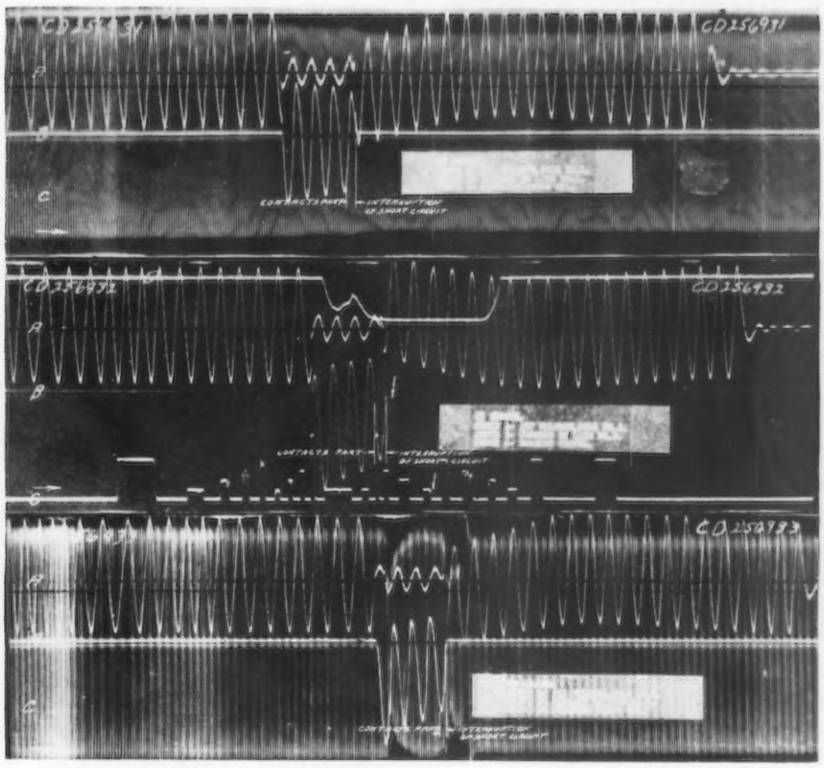
Operations Without Maintenance



Typical oscillograms of interrupting test. Breaker was closed in against a current of 45,000 amperes and interrupted 28,000 amperes (118,000 kv-a.) at 2300 volts, three phase, with 0.6 cycle arcing time and 3.2 cycles total operating time (Trip impulse to interruption.)

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(5) Interruption tests—all above 100,000-kva., three-phase on an OCO plus OCO duty cycle at 2300 volts, 6600 volts, and 13,200 volts.

After this complete series of tests and with the original contacts, this breaker was in good operating condition and able to carry its rated current at rated voltage without overheating.

The condition of the contracts after this series of tests is shown in an accompanying illustration. The arcing contacts may strike one as being considerably burned, but it should be remembered that the wedge contacts carry the main current and the arcing contacts may actually have ½ in. burned off the face and still retain sufficient contact surface and sufficient pressure to operate satisfactorily.

The small amount of maintenance required is illustrated in the test results which show that the arcing contacts needed no servicing after over 10,000 operations. After this number of operations, the oil was still in good enough condition to perform its functions in arc interruption and in maintaining proper breaker insulation.

The oil blast principle is of considerable aid in providing this low maintenance. The arcs usually are never more than one cycle (60-cycle basis) so that contact burning and oil deterioration are only a small percentage of that which obtains in ordinary plain break breakers. The oil blast action also assists in moving the arc over the contact surfaces, thus distributing the burning over the large area provided in the arcing contacts.

No replacement of links, pins, or other parts of the breaker was necessary. As a matter of fact, a further test of 40,000 mechanical operations was made without adjustment or replacement of mechanism parts.

July Decline In Steel Employment Moderate

RECENT sharp declines in steel operations are reflected in the report of wages and employment in the steel industry for July issued by the American Iron and Steel Institute. It shows that while the industry's operating rate in July declined from 52.68 per cent of capacity to 26.75, a drop of 49 per cent, employment and wages during the month were reduced much less severely.

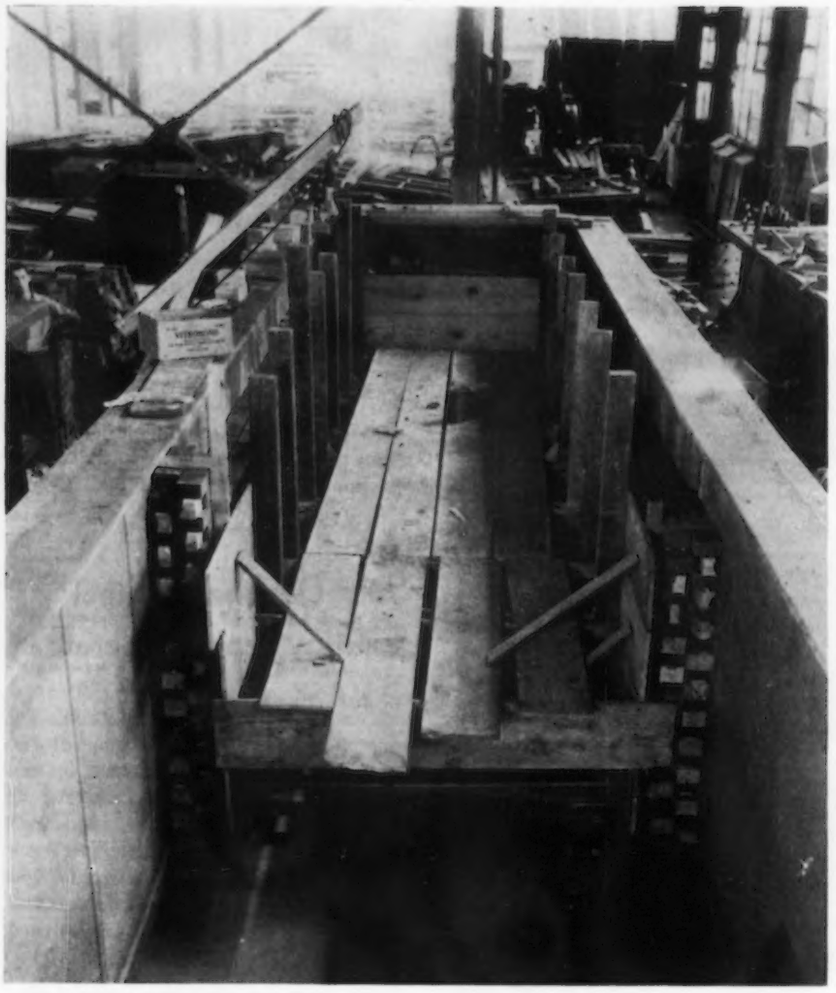
The number of wage earners employed in July was 383,673, as compared with 415,547 in the previous month, a decline of only seven per cent. Average hours worked per week for each wage earner was 24.4, compared with 35.7 in the previous month, a drop of 11.3 hours or 31 per cent.

Total wages exclusive of salaried employees were $26,150,272 in July, a decline of $14,480,042 or 35 per cent from the previous month. Average earnings per hr. among the wage earners declined only one per cent from 63.9 per hr. to 63.2.

The total number of employees in the industry in July was 424,126, compared with 455,966 in June. The total payroll for the industry was $34,913,-521, a decline of 31 per cent from June's total of $49,466,664.

Comparison Between July, 1934, June, 1934, and June, 1933

	July, 1934	June, 1934	June, 1933
All employees	424,126	455,966	338,146
Wage earners	383,673	415,547	305,239
Wages	$26,150,272	$40,630,314	$24,441,054
Hours per week per worker	24.4	35.7	39.4
Average earnings per hr.	63.2c.	63.9c.	47.3c.
Operating rate	26.75	52.68	45.37



Showing two courses of acid resisting brick being laid in place with Vitro-Bond. The rubber expansion joint in brickwork is 5/16 in. thick and is placed at the end of wall showing across bottom and up side. In front of the end of brick wall can be seen the Triflex expansion joints in the rubber lining spaced about 3 ft. apart, up the sides and across bottom.

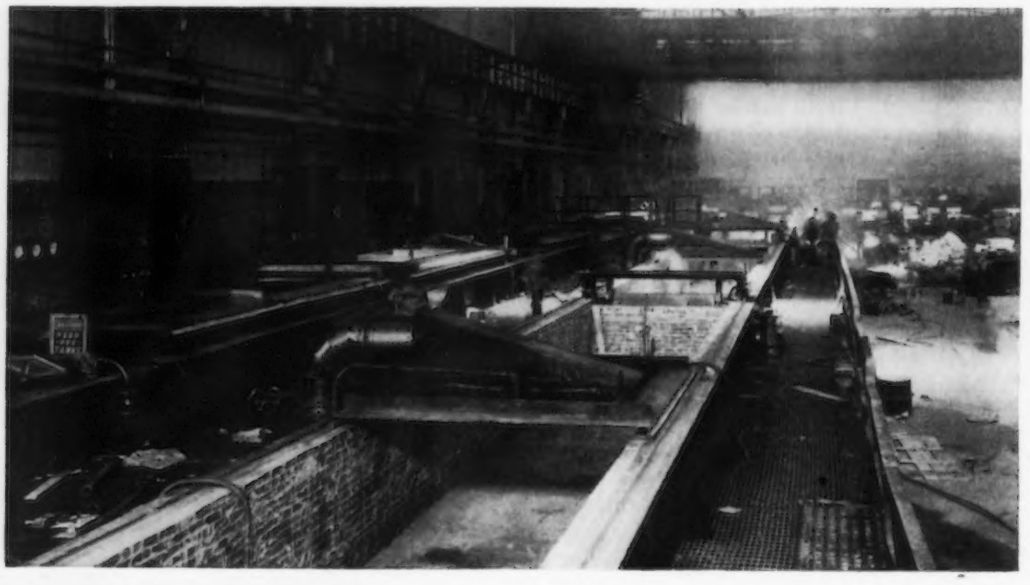
Modern Strip P

THE important and difficult operation of pickling sheet or strip has presented to engineers and operators the extremely vexing problem of selecting suitable materials of construction. Lead, concrete, brick, wood bitumastic and many other materials have been used and those reports of their relative serviceability, which emanate from various sources, are usually contradictory. A general summary of such reports probably would conclude that a completely satisfactory construction has not yet been developed, especially for the severe service conditions attending the continuous pickling of strip steel, where continuity and speed of operations are considered cardinal requisites.

Inasmuch as pickling is, in a sense, the intermediate operation between hot and cold rolling, it would seem highly desirable to perfect machinery and equipment with a life expectancy comparable to that used in these other allied operations.

Steel Containers

In the past the thought of using steel as a means of combating destructive action in the equipment used would have been considered foolhardy. In reality steel has played a very important role in the development and perfection of the installation to be dis-



Shows tanks, syphons, covers and ducts complete. This equipment has at this time given approximately two years of uninterrupted service.

Strip Pickling Equipment

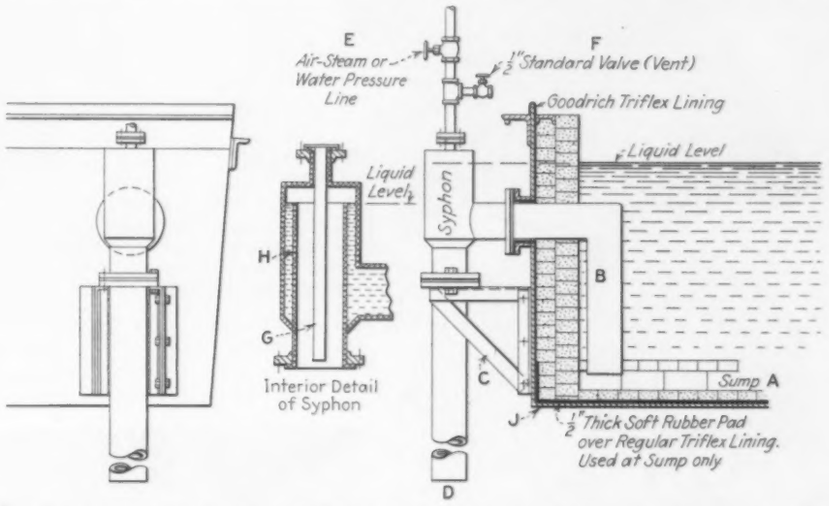
By DR. H. E. FRITZ
B. F. Goodrich Co.

cussed here. This installation is now in operation at the plant of the Inland Steel Co., Indiana Harbor, and is capable of handling strip up to 72 in. width.

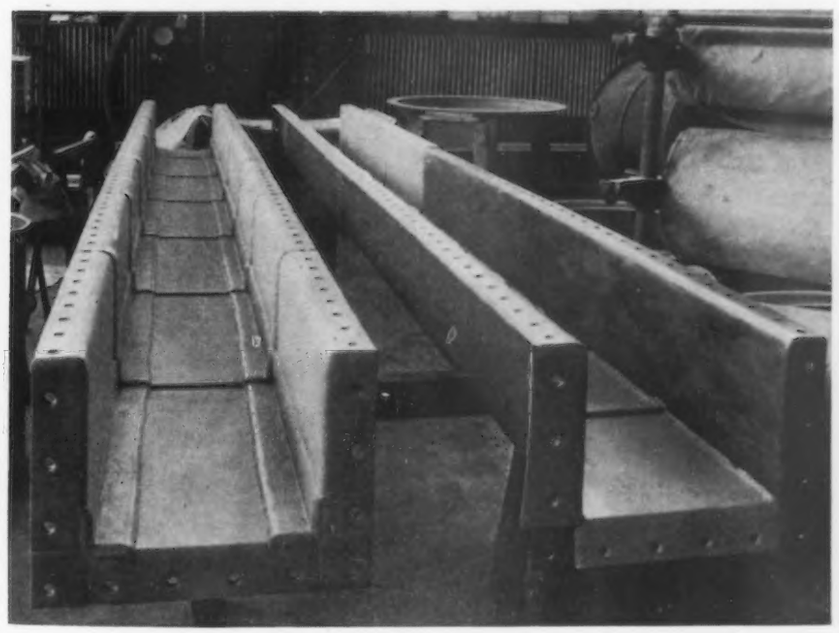
The acid tanks, four in number, have approximate dimensions of 60 ft. long, 8 ft. 7 in. wide, 4 ft. 4 in. deep. They are fabricated of steel and are lined not only with a ¼-in. thickness of Triflex rubber, but with a sheathing of 8 in. (two courses) of acid-resisting brick laid up in a sulphur base cement known as "Vitrobond." The rubber lining was applied by the Vulcalock process, so that expansion and contraction of the hard rubber had been provided for by placing the Triflex expansion joints at sufficiently frequent intervals. Rubber expansion joints also were provided for the brick sheathing, these joints being spaced according to calculations for maximum expansion and contraction. Such joints prevent buckling and cracking of brick walls.

In designing steel shells provision was made for installation of covers to effect fume removal and also to deflect any condensate from covers back into the tank proper. The steel acid tanks are mounted well above the floor level, so as to facilitate inspection at intervals and also to simplify painting problems.

The function of the brick sheathing is by no means to serve as an acid-tight container, for with the many thousand joints involved this is almost impossible, but it does serve as a heat insulator, thereby prolonging the life of the rubber which is really



Showing section through sump at end of tank and brickwork. Continuous acid leveling device made of chemical lead, supported to outside of tank at C. B extends down into sump. D connects to acid sewer. Section at G and H shows design of syphon inside. If vent valve at F is open, acid remains at liquid level. Close F and open E. Acid picked up through B by vacuum created and syphon started.



Rubber lined steel sewer section. Triflex of ⅜ in. thick is used. Note Triflex expansion joints at intervals

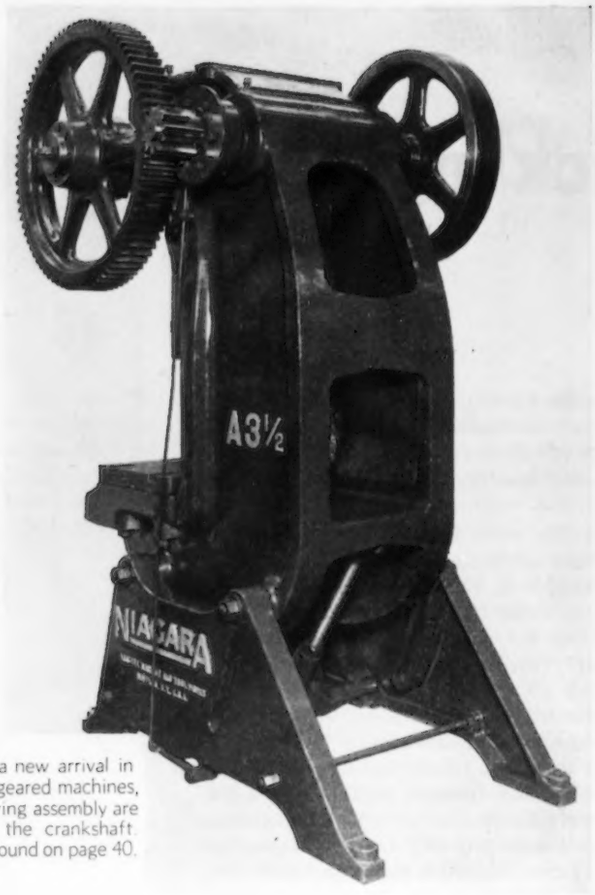
the acid-tight container, and also as a buffer against physical damage to the rubber, due to contact with sheet edges in passing through the tanks.

Most pickling operators object to bottom outlets because they are easily clogged by copper as crystals and sludge. They are also dangerous and a source of acid loss. The syphon scheme minimizes chances for crystallization of copperas in outlets. By allowing the water pressure to continue the sludge may be flushed into the sump and continuously discharged through the syphon.

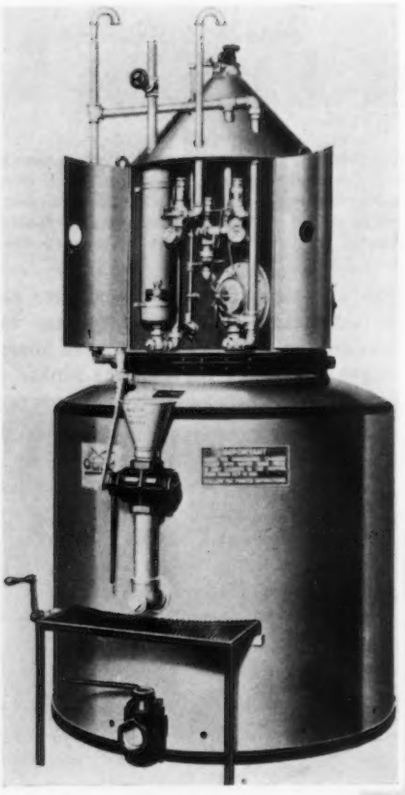
In cases where it was necessary to reduce the thickness of brick sheathing for any cause, an extra thickness of rubber was applied directly under the reduced thickness of brickwork, thus contributing greater heat insulation.

At the ends and between the tanks where the strip passes over the rub-

(Concluded on Page 96)



THIS husky specimen is a new arrival in the Niagara family. On geared machines, an oil sealed shaft and bearing assembly are mounted at the rear of the crankshaft. Further particulars will be found on page 40.



ABOVE

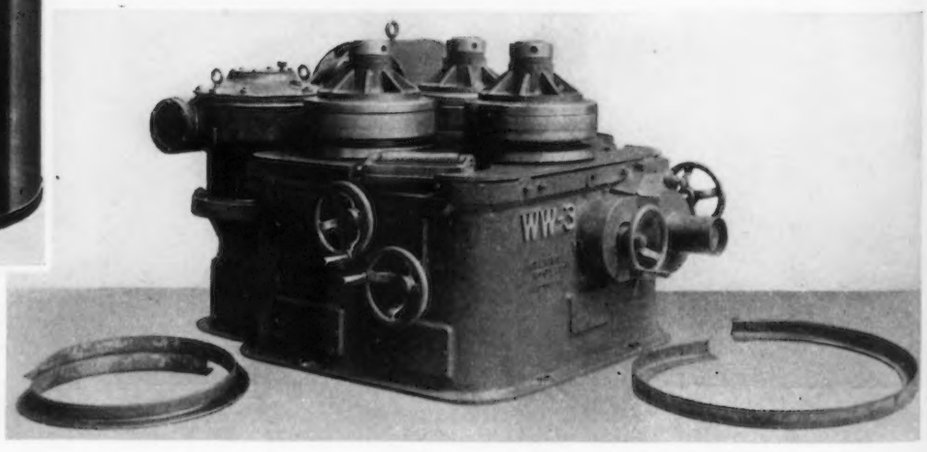
NON-CORRODING materials are used throughout in the construction of this 1000 cu. ft. per hr. acetylene generator which is a new offering of Linde Air Products Co Details are given on page 41.

AT LEFT

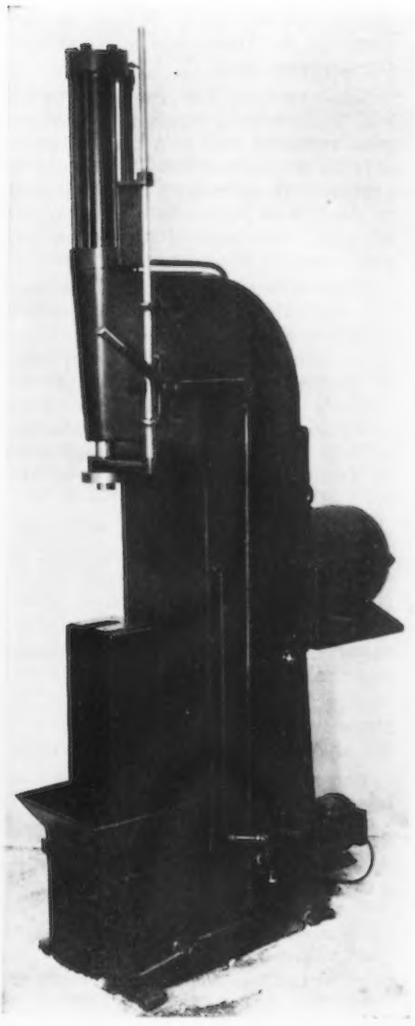
AIR REDUCTION SALES CO., New York, has developed this "Aircobraze" oxyacetylene outfit to enable plumbers and steamfitters to install "Walseal" threadless bronze fittings. Visible evidence that a joint has been made is the appearance of a white ring of Sil-Fos around the pipe. Also suitable for pipe welding.

BELOW

HERE is an angle and miscellaneous bending machine that can be moved from place to place via crane truck or casters. It is made in 4 sizes by Williams, White & Co. of Moline, Ill., and is described in detail on page 40.



BROKEN small drills, hitherto discarded because uneconomical to reclaim, can be put back into working shape by means of the new bench type grinder made by William Sellers & Co., Inc. Capacity from 1-16 in. to ½ in. Further details on page 40.



AT LEFT

THIS 3 ton hydraulic broaching machine, produced by the Fox Machine Co., has a number of original features which are described in detail on page 41.

AT RIGHT

THIS lathe type combination pipe and bolt threading machine has a capacity of ¼ in. to 2 in. pipe threads, or by applying bolt chaser holders will take care of bolts of from ⅜ in. to 1¼ in. It will also ream and cut off pipe. It has an inclosed motor connected to the geared headstock by silent chain drive and is a new product of Landis Machine Co. A more detailed description is on page 41.

Inclinable Power Press Of Rigid Design

THE Niagara Machine & Tool Works, Buffalo, N. Y., has added to its line of inclinable power press, the new machine, the A-3½, pictured on page 38. This machine of modern design combines the proven principles of the Niagara Inclinable line with the latest developments in the design of power presses.

The frame is a semi-steel casting and is proportioned to obtain maximum strength and rigidity for the given weight. At the same time, the metal is distributed to assure solid castings with minimum internal strain. The main bearings in the frame are tied together by webs and constructed so that the pressure from the crankshaft is transmitted directly to the frame. This construction assures accurate alinement and proper lubrication of bearings. On geared machines, a unit assembly, consisting of a tube in which the anti-friction bearing backshaft is mounted, passes through accurately bored openings in the frame positively alined with the crankshaft. The tube forms a seal lubricant reservoir for the anti-friction bearings.

The long slide is accurately guided by two removable gibs securely bolted to the frame and provided with adequate take-up to compensate for wear. Each gib has double V-ways which give additional wearing surface, greater rigidity, and more accurate and positive alinement. The ways are lubricated by oil cups on top of the gibs. The slide face and the new ram clamp are constructed to give maximum support and additional clamping for punch holders.

The Niagara improved pin-type clutch is employed. This has four engaging points, positive stop to prevent repeating and an indicating arrangement on the brake to quickly and positively show when proper adjustment and operation are obtained.

The motor drive bracket is bolted to machined pads on top of the frame. This location keeps the center of gravity near the center of the machine and makes it possible to incline or raise the frame with less effort.

The extremely rigid frame and the accurate positive guided slide with additional support and clamping for punch holders is employed, resulting in maximum die life, while the improved clutch results in easier operation, greater safety and increased production.

Bench-Type Grinder Reclaims Broken Drills

FOR sharpening and reclaiming twist drills ranging in diameter from 1/16 to ½ in., William Sellers & Co., Inc., Philadelphia, has developed a bench-type grinder utilizing the same principles of chucking and grinding as its larger drill grinders. The machine is equipped with a built-in motor and push-button control, and is furnished complete ready for connection to the shop power line. It is offered not only for the accurate and rapid resharpening of dull drills, but for rough and finish grinding, in one operation, of badly burned and broken drills. It is stated that broken small drills, usually discarded because they are tedious and uneconomical to reclaim, may be reconditioned quickly and economically. Pictured on page 39.

As small drills are delicate and difficult to handle, the chuck of this machine is a major component. Unobstructed location of the chuck facilitates insertion of the smallest drills, and only a quarter of a turn of the clamping knob is required to secure proper grip of the drill in the jaws. As the chuck clamps the drills mechanically, no hand pressure is required to hold the drill while grinding.

The drill is held at three points between two hardened steel jaws, which grip the edges of the flutes close to the cutting lips. An adjustable back center supports the shank, leaving the body of the drill entirely free. The chuck is limited in rotation to less than 180 deg., and the drill is reset so that each lip is chucked in the same position for grinding, thus assuring identical lips and concentricity of the point with the axis of the drill. As the chuck holds the drill so that the tool's axis is in correct relation to that of the wheel, correct clearance from the periphery to the point of the drill is automatically assured.

The chuck is carried on two dust-protected slide rests, one parallel to the axis of the wheel and the other parallel to the face of the grinding wheel. These slides are of dove-tail type with adjustable shoes. Movement of the chuck toward the face of the wheel is controlled by micrometer handwheel adjustment, and movement across the face is controlled by a lever.

A 5-in. diameter cup type wheel mounted directly on the armature shaft of the ⅜-hp. ball-bearing built-in driving motor is employed. In grinding, the drill is passed back and forth across the face of the wheel, producing a flat surface that results in maximum life of the grinding wheel. Slides, as well as motor, are fully protected from abrasive dust and dirt and are lubricated by the Alemite system. The machine is 12 in. high and it requires bench space of 13 x 16 in. and overall space of 18 x 23 in. Complete, it weighs approximately 110 lb.

Angle and Miscellaneous Bending Roll

BUILT by Williams, White & Co., Moline, Ill., the new angle bending machine illustrated on page 38 is designed to eliminate various difficulties encountered in rolling angles.

One of the outstanding features is that the machine, being a self-contained unit, can be moved any place, and is ready to operate as soon as the wires are plugged in. It needs no pit or foundation, as the massive cast steel frame is sufficiently strong to keep all parts in alinement. It can be mounted either on wheels to run on industrial track or on casters. Lugs on the frame are also provided for a crane hitch.

The machine has motor attached and is driven through a worm and gear reducing unit to a train of gears driving the three rolls. The roll shafts are vertical, allowing the angles to be worked in a horizontal position, and all gears are inclosed inside the cast steel base.

Hand-wheels are located on each side for raising and lowering the side supporting rolls and for adjusting them horizontally for different radii of angles. A hand-wheel on the operator's side, attached to a worm and gear on the front of the machine, adjusts the front roll. A hand-wheel in front is arranged for quick return of the movable roll.

The standard rolls are adjustable for all angles within the capacity of the machine, and special rolls can be furnished for rolling I-beams, channels, T's, Z-bars, flats on edge, rounds, squares, pipe, tubes, and miscellaneous shapes. The standard rolls will handle flats on flat and T's in the plane of the web or flange. Any of the above parts can be rolled in coils.

The machine is built in the following sizes:

No. 1 Angles legs out 3 in. x 3 in. x ⅜ in., legs in 2½ in. x 2½ in. x ⅜ in.

No. 2 Angles legs out 4 in. x 4 in. x ½ in., legs in 3½ in. x 3½ in. x ½ in.

No. 3 Angles legs out 6 in. x 6 in. x ¾ in., legs in 5 in. x 5 in. x ¾ in.

No. 4 Angles legs out 8 in. x 8 in. x 1 in., legs in 6 in. x 6 in. x 1 in.

Stationary Acetylene Generator Delivers 1000 Cu. Ft. an Hour

AN automatic stationary acetylene generator, the Oxweld type MP-5, pictured on page 38, rated to deliver 1000 cu. ft. an hour, has been brought out by the Linde Air Products Co., 30 East Forty-second Street, New York. In principle it is identical with the company's type MP-4 portable equipment.

Feed is of gravity type. The feed control unit is self-contained, and is bolted to the inside of the carbide hopper. The feed valve unit is actuated by a diaphragm. Pressure on the diaphragm is exerted by a loaded spring unit, the spring being encased in a small housing and set to deliver about 13 lb. per sq. in. This pressure can be changed within a range of about 2 lb. per sq. in. by an external adjustment. The set pressure does away with the necessity of making of settings when the machine is started. Pressure variation within the generator is said not to exceed ¾ lb., and this variation is nullified in the service line by a built-in regulator.

The carbide-charging door, water-filling opening, residue valve, and handhole are proportioned to save time in emptying, recharging and inspecting. A valve on the service pipe leads directly from the back-pressure valve. A separate relief valve with an outdoor vent line is provided for the back-pressure valve, and two other relief valves with a common outdoor vent line are provided for the generator chamber.

The hopper has eyelets around the top so that it can be removed with a block and tackle. A soft rubber seat on the hopper outlet assures a gas-tight seal and lessens slaking when the generator is out of service for long periods. The hydraulic back-pressure valve and the reservoir are combined in one shell. Non-corroding materials are used throughout, and where exceptional strength is required galvanized steel or stainless steel parts are employed. Most of the seams are bronze welded.

Compact 3-Ton Hydraulic Broaching Press

THE 3-ton hydraulic broaching press recently added to the line of hydraulic forcing and broaching machines built by the Fox Machine Co., Jackson, Mich., shown on page 39, has a strong one-piece frame, and is arranged so that the base serves as a reservoir for cutting compound and the column as a reservoir for oil. The Vickers hydraulic feed pump employed is mounted on a bracket with its driving motor so that by disconnecting the delivery pipe from the pump the bracket carrying motor and pump unit can be lifted free from the machine frame. Cutting compound pump and driving motor can be removed from the lower part of the frame in the same manner. The control valve is located in a recess at the back of the frame in such a way that all piping is confined within the frame. Should any leaks develop at the pipe joints, the oil would drain back to the oil reservoir, first passing through a filter.

The pan and table at the front are separate pieces. The pan serves to collect compound from the work and return it to the reservoir in the base. The table can be replaced with others of different heights to accommodate a wide variety of work.

The nose of the ram carries an arm which supports a vertical rod on which are located two stops. One stop governs the depth of stroke and the other determines the distance to which the ram returns on its upstroke. When the operator steps on the pedal or pulls down the hand lever, the control valve is latched in position to provide down movement for the ram; he does not have to keep his foot on the pedal or his hand on the lever during the working stroke. As soon as the desired depth has been obtained, the ram automatically returns. At any time during the downstroke, the operator can push the hand lever up and produce up movement of the ram. When the ram reaches its upper set position, the pump delivery is by-passed. Compound flows to the broach only when the ram is moving downward; as the ram reverses the flow is automatically cut off.

Pipe and Bolt Threader For Maintenance Work

A COMBINATION pipe and bolt threading machine named the Little Landis has been added to the line of the Landis Machine Co., Waynesboro, Pa. Of lathe type, in which the work is revolved, it is said to be the only machine of its type that employs the Landis die head and the Landis Long Life patented chaser. It is designed to thread, ream and cut-off pipe and to thread bolts, rods and similar parts. Light weight, quick set-up, and economical operation are features emphasized.

Built-in motor-driven type only, the machine employs a 1-hp. motor and control of industrial type. The motor is inclosed in a compartment in the bed and connected to the geared headstock by silent chain drive. The bed is of one-piece box-type construction. The gear box, through which three changes of speed are obtainable, is cast integral with the spindle housing to assure maximum rigidity. All gears are of steel, with cut teeth, and operate in an oil bath. The cross-rail, which supports the die head and cutting-off and reaming tools, is integral with the carriage. The unit is of sturdy design and is located centrally on the carriage to eliminate overhang. A scroll chuck of three jaw universal type is employed.

Of new design, the die heads combine light weight with rigidity and strength. The heads are of quick-opening type and have a universal adjustment for size. Two die heads having a combined capacity of ¼ to 2 in. are standard equipment. By applying bolt-chaser holders, the 2-in. head can be used for threading bolts from ⅜ to 1¼ in. The die heads are adjusted for diameter through a self-locking ratchet screw, the adjustment being universal and made quickly. The setting of the chasers in the chaser holders remains constant for all diameters. Chasers are of Landis tangential type, of the same design as those employed in the standard line of Landis die heads and machines.

The die heads are supported on two pins extending from the front face of the cross-rail. Being of light weight, the heads can be handled readily, thus facilitating changes in set-up.

Developments In British Steel Industry

PROGRESS on new British steelworks has reached a very interesting stage. The great new Midland steelworks at Corby has recently completed the installation of its coke-oven and by-product plant and has already put them into operation. The plant comprises a modern coal washery, coal storage and blending plant, compound coke-ovens of the Becker type with modern coke quenching, conveying and screening equipment, and a complete installation for the recovery of tar, ammonia, benzol, and other important by-products.

Another new steelworks is to be established in Cardiff, according to the Industrial Development Council of South Wales and Monmouthshire. Sir John Beale, chairman of Guest, Keen & Nettlefolds, Ltd., stated at the annual meeting of the concern recently that they were about to spend over $750,000 on the construction of a plant for the manufacture of steel rods and bars. The plant is to be erected on a site adjoining the proposed £2,000,000 ($10,000,000) works of the British Iron & Steel Co., Ltd., at East Moors, Cardiff.

Seamless Drawn Allegheny Metal Used For Tapered Crystallizing Vessel

A UNIQUE corrosion resisting chemical vat was recently completed by Lalance & Grosjean Mfg. Co., manufacturing chemists located at Woodhaven, N. Y. The vessel shown in the accompanying illustration was drawn from a blank (18-8) Allegheny Metal which measured 55 in. in dameter. The completed vessel has a taper of 20 deg., the diameter of the top is 35 in., the depth is 26¾ in., and it has a thickness of 1½ in. This tank will hold 50 gal. of liquid, and will be used for storing or crystallizing commercial acids.

The vessel was fabricated in five drawing operations with correct anneals between each operation. After complete forming, the inside of the tank was thoroughly ground. A 200-grit emery wheel was used for the final grind. Finally the complete tank was passivated to remove all foreign matter and then delivered to one of the leading chemical houses in New York.

Advantages Claimed For New Carburizer

E. F. HOUGHTON & CO., Philadelphia, has announced a new carburizer, designated as the "Perliton liquid carburizer," for small work. It is stated that in a given time this carburizer has given two to three times the penetration as compared with other methods now in use—an important factor in speed of modern production. Pot life up to 1200 hrs. has also been shown, compared with an average of 300 to 500 hrs. for other liquid salt bath mediums. Other advantages claimed include uniformity in depth of case and carbon content, lower cost per ton of steel, no decarburization; non-hygroscopic; high thermo conductivity; lower consumption than other salt mediums; no variation in degree of fluidity; reduced heating time and no rust after water quenching.

It is stated by the manufacturer that "in the past it has been difficult to control the depth of case and carbon content on small parts when carburized on a production basis using large carburizing boxes. Parts packed close to the sides of the boxes showed greater carburized depth and higher content than those packed in the center. The time required to pack and unpack boxes, heat them to proper temperature, etc., was an obstacle to rapid heat treatment and an added expense."

The Perliton process is true carburization; the same type of case is obtained as produced by any of the solid carburizers requiring pack hardening. Perliton is especially adapted for carburizing work requiring a depth of case from skin hardness to 0.04 in. The surface can be ground to leave a file hard surface, provided the grinding does not extend beyond the eutectoid area.

Work on the process is said to have begun in the company's German plant two years ago and it is said that the process has been tested by large metal working concerns in Germany and by large automotive plants in the United States.

New Alloy Bar Plant At Sheffield

NEW plant of a very interesting nature has just been erected at the Vickers Works of the English Steel Corpn., Sheffield, England. It is intended for dealing with bright and black alloy steel bars for the aircraft, automotive, and general engineering industries, and includes sections for heat treatment and for centerless grinding and bright drawing.

The new heat treatment section contains three regenerative furnaces which are fired by town's gas and are capable of operating at any temperature up to 1200 deg. C., with a heavy reducing atmosphere. Thermostatic control enables the temperature to be regulated within 10 deg. C. For charging and discharging there is an electrically operated machine running on a rail track in front of the furnaces and treatment tanks which is capable of dealing with loads up to 4½ tons.

The furnace charge is prepared on stationary loading tables by means of an electric overhead crane, the bars being suspended on heat-resisting steel bearers. The charge and bearer bars are lifted bodily by the charging machine, transferred into the furnace, and deposited on the hearth, the "peel" of the charging apparatus being withdrawn through slots in the furnace hearth after the charge has been deposited. In discharging the process is reversed. Bars up to 6 in. in diameter and 16 ft. in length can be treated.

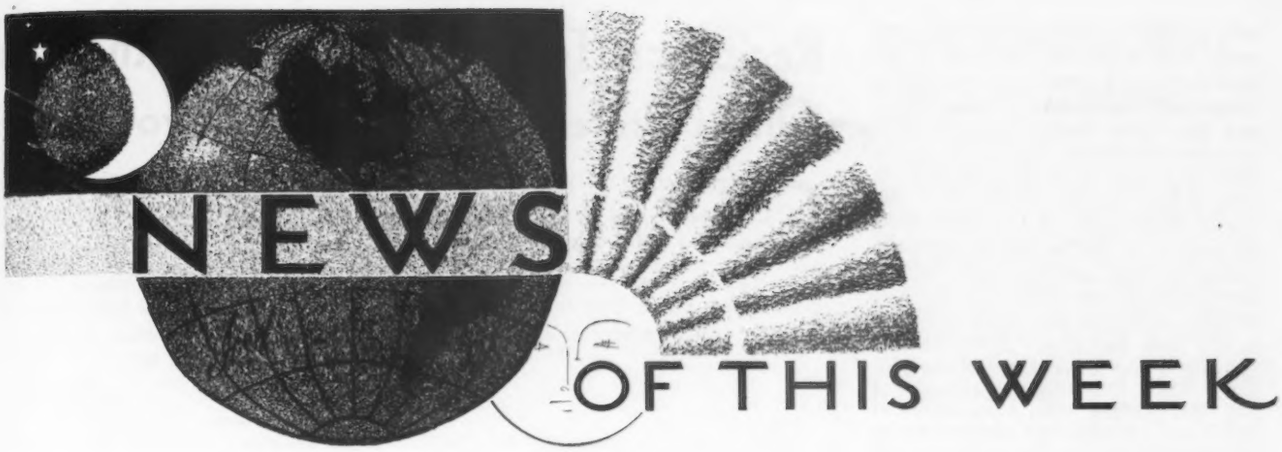
Quenching in water or oil is carried out mechanically, the charge being withdrawn from the furnace and transferred by the charging machine to a skip suspended over the treatment tanks. The whole operation of transferring a charge from the furnace and immersing it in oil or water can be performed in 35 sec. for any load up to 4½ tons. As the bar stock is supported throughout the treatment, distortion, with the subsequent cold straightening it would involve, is largely eliminated. A steel warehouse, 150 ft. in length by 60 ft. span, is equipped to deal with the output of the heat-treatment section, its layout being so arranged that examination, testing for quality by spark and spectroscope, straightening, sawing, cropping, and dispatch can be carried out in proper sequence with a minimum of handling.

In the centerless grinding and bright drawing sections there are two Lidkoping centerless grinders capable of grinding bars from 1/16 in. up to 4 in. in diameter to precision limits in lengths up to 30 ft., associated with reeling machines of special type for the precision straightening of high-tensile heat-treated stock. In addition to grinding and drawing round stock, provision is also being made for grinding flats, squares, and hexagons by means of a Snow grinding machine, in conjunction with a precision straightening machine of the multiple roller type.

Milling Cutter Simplification

Simplified Practice Recommendation R36-34, referring to milling cutters, is now available in printed form and copies can be obtained from the Superintendent of Documents, Government Printing Office, Washington, for five cents each, according to the Division of Simplified Practice, National Bureau of Standards.

This regulation, which was first promulgated in 1925, is concerned with diameters, thicknesses and other important dimensions of various types of milling cutters, such as plain milling, involute gear, screw slotting, keyseat, and mills for various purposes, and slitting saws, used on machine tools.



Houde Decision Brings Labor Issue to a Head

A SHOW-DOWN on the closed shop issue was brought nearer by moves made by the National Labor Relations Board and the National Steel Labor Relations Board at Washington last week. In interpreting Section 7a of the National Industrial Recovery Act in the case of the Houde Engineering Corpn., Buffalo, and the United Automobile Workers Federal Labor Union No. 18839, the national board held that representatives of the majority shall constitute the exclusive agency for collective bargaining with the company.

The board ordered that unless the company notifies it within 10 days that it has recognized the union as its employees' exclusive agency for collective bargaining and that it will negotiate with the union for settlement of present difficulties, the case will be referred to the NRA and the enforcement agencies of the Federal Government for appropriate action.

The national board's decision conflicts with interpretations of Section 7a made by General Johnson and Donald R. Richberg in August, 1933, and in February of this year, and with the President's own interpretation in the settlement of the threatened automobile strike, when he stipulated that if there be more than one group of employees "each bargaining committee shall have total membership pro rata to the number of men each represents."

It is not known what action the Houde Engineering Corpn. will take, but it would be surprising if the ruling of the board were not contested in the courts. The decision, in the opinion of employers, clearly violates the expressed intent of Section 7a, which provides that "employees shall have the right to organize and bargain collectively through representatives of their own choosing." To force a minority to accept representation not of its own choosing is directly counter to the evident aim of the clause.

A new element of disturbance was introduced into industrial relations in the steel industry when the National Steel Labor Relations Board announced that it would give consideration to a petition for a new election of employees at the Weirton Steel Co. At the same time the Department of Justice in connection with the case of the United States vs. the Weirton Steel Co., pending in the district court at Wilmington, Del., announced that it would ask permission to file an amended and supplemental bill, eliminating from the case the allegations concerning the necessity for an election. The action taken concurrently by the Department of Justice and the steel board is intended as a recognition of the appropriateness of the administrative remedy provided by Congress in respect to labor controversies under Section 7a. Whereas the trial of the Weirton case is set for Sept. 5, a postponement has been requested to allow the defendant further time to answer the new bill.

As yet no elections have been held under the steel board's supervision. An election of employees of the Apollo Steel Co. previously ordered by the board was called off at the request of the Apollo Lodge of the Amalgamated Association of Iron, Steel and Tin Workers, when the company admitted that the union represented a majority of its employees. An election of the employees of the West Virginia Rail Co., Huntington, W. Va., to determine their will in the matter of collective bargaining representation has been ordered by the board for Thursday, Sept. 6.

The possibility that an election will be held at the Weirton Steel Co. is regarded as remote in view of that company's determined stand to date against outside interference with its employee relations plan. A demand for a new election would raise the same issues which led to the present litigation and, if pressed, might finally result in a court test of the authority of the steel labor board or the national labor board, or both, and the constitutionality of the National Industrial Recovery Act.

South African Steel Industry Developing

A STRONG effort to establish the new Pretoria iron and steel works is now being made by the South African Iron & Steel Industrial Corpn. It is hoped that customs protection will prove unnecessary, but Dr. H. J. van der Bijl, chairman, recently assured stockholders that every possible step would be taken to guard against unfair dumping. The Government's policy of protecting the new industry is implied in the Act of 1928, which specifically provides for the adding of a dumping duty to the prices at which the corporation's products are to be sold to the South African railroads and Harbors.

A village has been built at the iron mine and the necessary railroad has been constructed, so that regular supplies of ore are being received at the works. The blast furnace started operation in March. In the production of blast furnace coke 75 per cent of Transvaal and 25 per cent of Natal coal are being consumed. It is estimated that it takes approximately one ton of this coke to produce a ton of pig iron, but the consumption of coke per ton of pig iron has so far been only 1700 lb. The corporation's dolo-

mite quarry is supplying dolomite reguarly over a private railroad to the blast furnace, a distance of four miles. Transvaal limestone is being used, and the State Railroad Administration has completed the line it undertook to construct under a guarantee from the corporation to transport annually 50,000 tons of limestone from the quarry at Marble Bar to Pretoria.

The present average rate of pig iron production at Pretoria is 450 tons per day, while the maximum produced is 570 tons per day. Since the beginning of April the steel melting furnaces have produced an average of 550 tons per day, with a maximum of 580 tons. Production figures up to the middle of June are given by the chairman as follows: benzole, 134,000 gal.; creosote, 95,000 gal.; crude tar, 570,000 gal.; coke, 66,800 tons; pig iron, 40,000 tons; ingots, 20,000 tons; rolled sections, 9000 tons. The revenue to date from the sale of products is approximately $300,000 while the stock of products on hand is valued at about $1,150,000.

Two agreements, one with the South African Railroads and Harbors and the other with John Lysaght, Ltd., and Baldwins, Ltd., insure the disposal of 100,000 tons of the corporation's output per annum. The cooperative agreement with the Lysaght and Baldwins firms concerns the disposal of the corporation's entire output of black and galvanized flat and corrugated steel sheets. The capacity of the sheet mills to be erected by the end of this year is 33,000 tons per annum. A selling arrangement will provide an outlet for some 37,000 net tons of sheet bars to be rolled in the heavy mill of the main works at Pretoria.

Radiator Company Has Credit Plan

AN installment-payment credit plan, patterned after the National Housing Act and offering three-year terms without initial down payments to home owners in connection with the installation of heating equipment, has just been announced by the National Radiator Corpn., Johnstown, Pa. The plan provides for personal character loans on heating installations ranging from $100 to $2,000 in cost. Carrying charges are to be similar to those in effect under the provisions of the housing act.

According to Robert S. Waters, president of the corporation, the plan aims to stimulate sales of heating equipment by enabling prospective home-owner purchasers to arrange for liberal financing within the industry. The credit arrangements will be handled entirely by National Radiator Corpn. with contractors responsible only for guaranteeing the quality of the work involved.

Reciprocal Trade Agreement With Cuba Offers Preferences on Metal Products

CONCESSIONS on United States iron, steel and metal products imported into Cuba are provided for in the reciprocal trade agreement recently signed by the two countries. As pointed out in THE IRON AGE last week, a partial restoration of an important American export market is promised as a result of the treaty.

Old and new tariff rates as well as the old and new margins of preference in favor of the United States on important metal products are shown in the accompanying table.

Item No.	IRON OR STEEL	*Rates to U. S. in Cuban Pesos (per 100 kilos)* New	Old	*Margin of Perference to U. S., Per Cent* New	Old
32-A	Cast iron soil and drain pipes and fittings with a diameter of 6 in. or less	1.625*	1.875 for pipes 2.25 for fittings	35	25
32-B	Cast iron reinforced pressure pipes and fittings with a diameter of 6 in. or less	0.54*	1.875 for pipes 2.25 for fittings	40	25
32-C	Cast iron pipe of all kinds and fittings with a diameter more than 6 in.	0.36*	0.45	40	25
32-D	Other accessories of cast iron for pipes, not specified	1.80	2.25	40	25
32-G	Other articles of cast iron	1.20	1.50	40	25
34-A	Cast iron furniture of all kinds	3.60* plus 12 per cent ad val.	4.50 plus 15 per cent ad val.	40	25
34-B	Show cases and other manufactured articles of cast iron, enameled, coated or porcelained	2.60*	3.00	35	25
36-B	Bars of all shapes, including rods and rims and hoops of rolled wrought iron or steel	0.30*	0.30	60	25
37-A	Rolled sheets of wrought iron, with a thickness of 3 mm. or more	0.84	1.05	40	25
37-B	Rolled sheets of less than 3 mm. in thickness and strap iron	0.90	1.125	40	25
37-E	Rolled sheets, polished, corrugated, perforated, cold rolled, galvanized or not, and polished strap iron	1.20*	1.50	40	25
39-B	Wheels of wrought iron, weighing up to 100 kilos	1.12	1.20	30	25
39-C	Fishplates, bearings, sleepers, mill-rolled axles or straight axles, springs for railway and tramcars, and journal boxes	0.60	0.75	40	25
40	Piping, cylindrical, triangular, octagonal, or any other form, whether or not coated or galvanized, except special tubes for boilers	0.30	0.375	40	25
41-A	Wire, galvanized or not, with a diameter from 2 to 8 mm.	0.35	0.375	30	25
41-B	The same, with a diameter from ½ to 2 mm.	0.60	0.75	40	25
41-D	Cables	0.90	1.125	40	25
41-G	Fencings and grille work for farmers	0.60	0.75	40	25
42-A	Large structural beams, bars and shapes of all kinds, not cut to measure	0.32*	0.33	60	25
43	Anchors and chains for vessels or machinery	0.975	1.125	35	25
45-A	Wire gauze having up to 19 threads in a square of 23 mm.	2.50	3.75	50	25
47-A	Fine tools for the arts, crafts and professions	3.00*	3.75	40	25
47-E	Non-specified tools and implements	1.80*	2.25	40	25
48-A	Nails, brads and rivets	1.625*	1.875	35	25
48-B	Screws, nuts, bolts, washers, tacks, etc.	2.10*	2.25	30	25

(Continued on Next Page)

Item No.		Rates to U. S. in Cuban Pesos New	Old	Margin of Preference to U. S., Per Cent New	Old
	IRON OR STEEL	(per 100 kilos)			
49	Bits, stirrups, spurs and other saddlery accessories	2.10* (per kilo)	2.25	30	25
50	Buckles of all kinds	0.14*	0.15	30	25
52	Pins, hooks and eyes, hairpins and snaps	0.30	0.375	40	25
53-A	Cutlery, with handles of wood, iron, horn, bone or composition and table knives and forks with such handles, whether or not tinned or nickeled in whole or in part	0.15	0.175	40	30
53-C	Pocket knives with handles or ordinary metal, including safety razors not coated, nor gold nor silver-plated	0.36 (per 100)	0.42 (per kilo)	40	30
53-F	Safety razor blades of steel	0.30*	2.10	40	30
57-B	Non-specified manufactures of iron or steel, ordinary	(per 100 kilos) 1.80 plus 12 per cent ad val.	2.25 plus 15 per cent ad val.	40	25
58-B	Fine furniture of iron or steel	3.60*	4.50	40	25
58-C	Non-specified manufactures of iron or steel, fine	3.30	4.50	45	25
	COPPER AND ALLOYS	(per 100 kilos)			
61	Copper and its alloys of ordinary metal, in bars of all kinds	2.45*	2.80	30	20
62-A	Rolled copper plates	2.40*	3.20	40	20
62-B	Copper, laminated, in rolls, for roofing, with a weight not exceeding 3 oz. per sq. ft.	2.10*	3.20	30	20
	NOTE—When the copper sheets are covered on one side with tarred or pitched fabric, cardboard, paper or other similar materials, they shall be subject to a surcharge of 20 per cent of the foregoing duty.				
62-C	Leaf or powdered copper	7.00	8.00	30	20
63-A	Copper wire, with a diameter of 1 mm. or more	3.00	4.00	40	20
63-B	The same, with a diameter of less than 1 mm.	4.20*	4.80	30	20
64-A	Copper wire, sheathed with pipe and various insulating or protective materials	1.80	2.00	40	20
64-B	Non-specified copper wire and cable	8.00*	8.00	50	20
65-A	Copper wire gauze, containing up to 99 threads in an area of 23 mm. square	16.25*	20.00	35	20
65-B	The same, containing 100 or more threads	35.00*	40.00	30	20
66-A	Pipe, plates for fire boxes, and pieces used for boiler making, of copper partly worked	4.48*	4.48	20	20
66-B	Bearings of copper	12.00*	12.00	20	20
67-B	Copper nails and tacks, not varnished or nickeled	21.00*	24.00	30	20
68	Copper pens, pins, crochet needles or hairpins and snaps	80.00*	80.00	20	20
69-A	Manufactured articles of copper, polished, varnished or nickeled	30.00*	40.00	40	20
69-B	The same, not polished, varnished or nickeled	12.00*	16.00	40	20
69-C	Articles of copper destined exclusively for hygienic and sanitary use	(per kilo) 0.20*	(per kilo) 0.20	20	20

*It is agreed that these duties are not to be changed during the life of the agreement.

Coast Aqueduct Will Take Large Tonnage

LOS ANGELES, Sept. 5.—The Metropolitan Water District of Southern California, this city, will take bids Oct. 3 under Specification 70, on the construction of the Colorado River aqueduct between a point six miles north of Earp, Cal., on the Phoenix branch of the Atchison, Topeka & Santa Fe, and a point 12 miles east of Indio, Cal., on the Southern Pacific, a distance of 110.62 miles.

Under this specification and another soon to be issued, 1800 tons of structural steel and 56,100 tons of reinforcing steel will be purchased beginning in two or three months. In addition, 9900 tons of plates and 400 tons of structural shapes for pipe will be furnished by the contractor if the steel alternative is accepted.

Quantity Differentials On Plates and Shapes

OUTSTANDING changes in the list of extras issued Sept. 1 by the American Iron and Steel Institute include the establishment of quantity differentials for mill orders on plates and shapes which heretofore had carried no quantity differentials and a change from the lump sum quantity differential that has prevailed on steel bars. The new differentials on the three products per 100 lb. are: 4000 to 5999 lb., 10c.; 2000 to 3999 lb., 20c.; 1000 to 1999 lb., 50c.; and under 1000 lb., $1. The establishment of these extras is expected to cause consumers to withhold orders until they can bunch them into larger lots. This is expected to apply particularly to railroad orders for plates.

Steel Makers Invited To Exhibit

IN connection with the bicentennial of Orange County, Va., the committee in charge is anxious to have exhibits showing different operations of mining and smelting ore and of finished products. It is pointed out that the first smelting of iron to take place in America occurred in the county in the year 1716, making such a display particularly appropriate. Those interested should communicate with Charles D. Winn, executive secretary, Orange County Bicentennial, Orange, Va. The celebration will be held Sept. 25 to 28.

... PERSONALS ...

H. M. WILSON has been elected president of Taylor-Wilson Mfg. Co., founder and machinist, McKees Rocks, Pa. He has been associated with the company since his graduation from Pennsylvania State College 11 years ago. He has held various positions in operating and sales work in the organization, and for the past 15 months was executive vice-president and treasurer. O. A. CHRISTIANSEN, formerly assistant treasurer and secretary, has been elected treasurer-secretary. Mr. Christiansen has been connected with the company since 1918.

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E. S. WALLACE has been appointed general manager of the Saginaw Steering Gear Division of General Motors Corpn., Saginaw, Mich. He formerly was manager of the Chevrolet plant at Bay City, Mich. He will succeed M. L. HILLMER, who will be assigned to other duties.

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J. M. JOHNSON has become associated with the sales staff of Rotary Electric Steel Co., Detroit. His connection with the steel industry began in 1919 with Automatic Products Co., Detroit. From 1926 to 1932 he was with Union Drawn Steel Co. and since that time with Bliss & Laughlin, Inc., in the Detroit territory. Sales staff of the Rotary company now consists of JOHN S. ANDREWS, manager; W. J. CLUCAS, assistant manager; W. R. PUTMAN and Mr. Johnson. J. P. DOANE will continue as manager of service. The executive and operating personnel of the company is comprised of H. M. NAUGLE, president; A. J. TOWNSEND, vice-president and general manager; W. H. COLVIN, JR., treasurer; E. S. MILLER, general superintendent; A. W. TAYLOR, purchasing agent; and N. F. MELVILLE, chief metallurgical engineer.

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J. D. AGNEW on Sept. 1 became affiliated with the sales department of the Aetna-Standard Engineering Co., Youngstown, Ohio, and will have his headquarters in Cleveland. Until recently he was connected with the Continental Roll & Steel Foundry Co.

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OTTO NONNENBRUCH, New England sales representative of the De La Vergne Engine Co., Philadelphia, has been transferred to the New York office, with headquarters at 120 Broadway, and will represent the company in both the New York and New England territory.

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A. D. WALTER, formerly identified with the Ohio Electric & Mfg. Co., Cleveland, has become associated with the Peerless Electric Co., Warren, Ohio. For more than 15 years he has specialized in the design and construction of small motors.

H. M. WILSON

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H. J. FRENCH, in charge of alloy steel development, International Nickel Co., Inc., New York, has been scheduled to speak on "The Role of Nickel in Steels" at the meeting of the Northwest chapter of the American Society for Metals, Sept. 10, at St. Paul, Minn.

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JOHN C. DILWORTH, for many years associated with the Dilworth Porter & Co., Inc., of Pittsburgh, has severed his connection with that company and has been appointed manager of railway sales for the Carnegie Steel Co. He will be in charge of all railroad specialties and supplies, a line with which he has been in close touch throughout his industrial career. Since his graduation from Sheffield Scientific School, Yale University, in 1905 he had been identified with the Dilworth Porter company, first in the operating department and later in sales work.

J. C. DILWORTH

R. W. DAYTON has been appointed an assistant metallurgist in Battelle Memorial Institute, Columbus.

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C. E. WESTOVER has been made superintendent of the Burnside Steel Foundry Co., Chicago. He entered the foundry business immediately upon his graduation from the University of Nebraska in 1908 and operated his own foundry until 1923. He then went with the Omaha Steel Works, as superintendent, and later was plant manager of the Denver works of the American Manganese Steel Co.

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L. S. STEPHENS, who has been identified with the Stephens-Adamson Mfg. Co., Aurora, Ill., since 1914, has been elected president, succeeding D. B. PIERSEN, who has been made chairman of the board. Mr. Stephens was made superintendent in 1921 and vice-president in charge of production in 1926. Mr. Piersen, one of the founders of the company, succeeds W. W. STEPHENS, who has resigned.

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C. J. BIANCHI has been elected president of the S-B Gear Corpn., 640 West Fifty-eighth Street, New York, maker of speed reducers of a new type. He has been in the gear business for more than 25 years, all of which time he has spent with the Sier-Bath Co.

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C. WILLIAM ANDERSON, secretary, Specialty Brass Co., Kenosha, Wis., has been elected president of the Kenosha Manufacturers Association to fill the unexpired term of James T. Wilson, who recently resigned as vice-president of Nash Motors Co., Kenosha.

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MAJ. PHILIP B. FLEMING has been named as acting deputy administrator of the Public Works Administration. Major Fleming, who has been executive officer of PWA since its beginning, will assume immediately the duties of COL. HENRY M. WAITE, deputy administrator, whose resignation, effective Sept. 1, was announced some time ago. Major Fleming is an officer in the Army Corps of Engineers from which he was temporarily detached last year for service with the Public Works Administration. As executive officer during the past year he has been Colonel Waite's principal assistant.

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M. HARVEY TAYLOR, formerly assistant superintendent, Central Iron & Steel Co., Harrisburg, is a candidate for the office of Secretary of Internal Affairs for Pennsylvania.

British Steel Demand Sustained—Tin Plate Agreement Settled

LONDON, ENGLAND, Sept. 4 (*By Cable*).—The British pig iron market is still quiet, but good autumn demand is anticipated, and active furnaces are well booked.

The British steelworks position is fairly satisfactory and mills are encountering good export demand, especially for rails. The Continental steel market is quiet, but some recent business is reported from the Far East. Some German steel mills are working three shifts daily. Germany recently exchanged rails for Brazilian coffee. The plight of the French industry is gloomy. Announcement of higher Indian duties on Continental steel in the near future caused dismay in Belgium where retaliatory action is urged. The International tin plate agreement has taken definite shape, and minimum price is now 18s. 2d. basis IC f.o.b. works port, operative for export sales for shipment up to three months ahead. On more distant sales the minimum price is 18s. 5d., but is only possible subject to permission of Administrator. Extras and allowances have been modified. The tinplate business has been suspended while agreement is digested.

British Prices, f.o.b. United Kingdom Ports

Per Gross Ton

Ferromanganese, export	£9	
Billets, open-hrth.	£5 10s.	to £5 15s.
Tin plate, per base box	18s. 2d.	
Steel bars, open-hearth	£7 17½s.	
Beams, open-hrth.	£7 7½s.	
Channels, open-hearth	£7 12½s.	
Angles, open-hearth	£7 7½s.	
Black sheets, No. 24 gage	£9 5s.	
Galvanized sheets, No. 24 gage	£11 5s.	

Official Continental Prices, f.o.b. Continental Ports

Per Metric Ton, Gold £

Current dollar equivalent is ascertained by multiplying gold pound price by 124.14 to obtain franc equivalent and then converting at present rate of dollar-franc exchange.

Billets, Thomas	£2	7s.	
Wire rods, No. 5 B.W.G.	£4	10s.	
Steel bars, merchant	£3	5s.	
Sheet bars	£2	8s.	
Plates, ¼ in. and up	£4		
Plates, 3/16 in. and 5 mm.	£4	2s.	6d.
Sheets, ⅛ in.	£4	7s.	6d.
Beams, Thomas	£3	2s.	6d.
Angles (Basic)	£3	2s.	6d.
Hoops and strip base	£4	2s.	6d.
Wire, plain, No. 8	£5	7s.	6d.
Wire nails	£5	15s.	
Wire, barbed, 4-pt. No. 10 B.W.G.	£8	15s.	

... OBITUARY ...

ARTHUR ANDERSON FOWLER, pig iron merchant, insurance underwriter, bank and corporation director, and notable also for his pencil portraits and volumes of sporting verse, died Sept. 2 at his summer home, Robinwood Camp, Hamilton County, N. Y. He was born in New York, March 1, 1878, attended Columbia University, New York, and Magdalen College, Oxford, and after six years in the export grain business with his father and in private banking, he entered the firm of Rogers, Brown & Co., in 1905. In 1925, he became president of the Rogers, Brown & Crocker Brothers, Inc., representing a merger of pig iron businesses; in 1928 he retired. His verses were published under the nom de plume of Somerset. Among his drawings the best known is a likeness of Commander Rostron of the Cunarder Berengaria, the achievement gaining for him the friendly "appointment" as portrait artist of the Cunard Line.

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JAMES MOORE, president of Richard Dudgeon, Inc., maker of hydraulic machinery and roller tube expanders, New York, died on Aug. 24, aged 73 years.

ARTHUR A. FOWLER

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ERNEST J. W. MULLER, chief engineer of the Adams Grease Gun Corpn., New York, died on Aug. 14.

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FRANK REES, managing director, Llanelly Steel Co., president of the Royal Metal Exchange, Swansea, and chairman of the South Wales Siemens Steel Association, died Aug. 28, aged 54 years.

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PHILLIP C. LEONARD, district sales manager at Chicago for the General Refractories Co., died Sept. 1. He had been with the company for 11 years. For a year and one-half he was district sales manager at St. Louis, having been returned to Chicago about a year ago. He was born at Joliet, Ill., 42 years ago. He received his schooling at Joliet and at Lombard College, Galesburg, Ill.

Worth Steel Reinstates Amalgamated Leader

WASHINGTON, Sept. 5.—The National Steel Labor Relations Board today announced settlement of the controversy over the discharge of John T. Slater, president of Fidelity Lodge, Amalgamated Association of Iron, Steel and Tin Workers, by the Worth Steel Co., Claymont, Del. Agreement was reached at a conference attended by Aaron Finger, Wilmington, Del., counsel for the company, and Charlton Ogburn, New York, counsel for the lodge, by which Slater will be reinstated as a finisher in the sheet mill without prejudice to his future advancement.

The board said it was agreed that there would be no future discrimination against Slater and that the company will look forward to advancing him to the position of roller as soon as business warrants.

"It was learned," said the board statement, "that the Worth Steel Co. has no intention of contesting at this time the constitutionality of Section 7 A of the National Industrial Recovery Act, or Public Resolution No. 44 under which the board was set up, in spite of allegations to this effect made in a motion filed with the board."

No F.o.b Mill Prices On Navy Steel

WASHINGTON, Sept. 5.—All bidders, except one, quoted delivered prices, Navy yards, on 132,000 lb. of plates on which the Bureau of Supplies and Accounts, Navy Department, opened bids yesterday. Joseph T. Ryerson & Son, Inc., quoted a price of 2.50c. per lb., f.o.b. cars or wharf, Pittsburgh, shipment on Government bill of lading. The bureau asked for bids on a shipping point basis.

Steel Imports Lowest in 10 Years as Exports Rise

Exports of Iron and Steel from the United States

(In Gross Tons)

	July		Seven Months Ended July	
	1934	1933	1934	1933
Pig iron	61	106	1,953	1,291
Ferromanganese	2	3	18	8
Scrap	155,812	47,552	894,660	393,972
Pig iron, ferroalloys and scrap	*155,875*	*47,661*	*896,631*	*395,271*
Ingots, blooms, billets, sheet bars	79	149	8,716	904
Skelp	9,665	3,568	50,450	8,230
Wire rods	576	1,038	16,374	7,264
Semi-finished steel	*10,320*	*4,755*	*75,540*	*16,398*
Steel bars	2,488	1,873	24,198	10,746
Alloy steel bars	136	129	1,845	739
Iron bars	47	96	601	300
Plates, iron and steel	3,717	1,097	21,374	3,781
Sheets, galvanized steel	5,551	2,958	36,317	17,926
Sheets, galvanized iron	113	141	886	545
Sheets, black steel	7,670	2,151	50,361	14,684
Sheets, black iron	879	133	2,725	977
Hoops, bands, strip steel	2,556	2,721	19,164	11,315
Tin plate terne plate	13,960	6,276	111,097	30,349
Structural shapes, plain material	2,663	1,299	16,952	4,979
Structural material, fabricated	1,025	927	10,134	7,511
Tanks, steel	430	336	4,156	1,392
Steel rails	4,229	1,576	46,983	8,278
Rail fastenings, switches, spikes, etc.	976	401	11,593	1,693
Boiler tubes	396	217	3,789	2,115
Casing and oil line pipe	4,984	1,644	39,467	16,761
Pipe, black and galvanized, welded steel	3,405	3,523	26,064	15,298
Pipe, black and galvanized, welded iron	165	158	1,320	826
Plain wire	3,241	1,526	21,908	6,116
Barbed wire and woven wire fencing	3,033	2,433	22,368	13,479
Wire cloth and screening	83	77	482	373
Wire rope	248	203	1,687	1,034
Wire nails	809	1,026	8,382	4,828
Other nails and tacks	400	322	3,041	2,119
Horseshoes	9	3	67	57
Bolts, nuts, rivets and washers, except track	427	214	2,867	1,761
Other finished steel	565	307	3,924	2,040
Rolled and finished steel	*64,205*	*33,767*	*493,752*	*182,022*
Cast iron pipe and fittings	712	1,128	8,107	5,321
Malleable iron screwed fittings	246	272	1,726	1,142
Carwheels and axles	491	142	2,338	2,333
Iron castings	711	254	4,626	1,328
Steel castings	231	178	1,233	490
Forgings	395	214	2,407	1,725
Castings and forgings	*2,786*	*2,128*	*20,437*	*12,339*
Total	233,186	88,311	1,486,360	606,030

Imports of Iron and Steel Products into the United States

(In Gross Tons)

	July		Seven Months Ended July	
	1934	1933	1934	1933
Pig iron	2,997	18,339	68,383	81,132
Sponge iron	53	52	743	272
Ferromanganese and spiegeleisen*	2,551	7,252	19,608	26,478
Ferrochrome†	31	....	65	21
Ferrosilicon‡	46	31	577	82
Other ferroalloys	....	....	46	102
Scrap	933	13,391	28,135	22,909
Pig iron, ferroalloys and scrap	*6,611*	*39,065*	*117,557*	*130,996*
Steel ingots, blooms, etc	35	20	698	371
Wire rods	791	1,753	7,523	7,818
Semi-finished steel	*826*	*1,773*	*8,221*	*8,189*
Concrete reinforcement bars	336	122	818	1,707
Hollow steel bars	131	44	512	520
Merchant steel bars	1,881	1,605	11,077	10,481
Iron slabs	....	....	1	1
Iron bars	163	48	509	243
Boiler and other plate	47	11	128	122
Sheets, skelp, and saw plate	378	705	2,563	5,881
Tin plate	15	14	106	202
Structural shapes	1,665	2,306	11,920	15,106
Rails and rail fastenings	254	2,581	1,880	3,397
Welded pipe	154	475	1,177	2,150
Other pipe	104	166	1,871	846
Barbed wire	1,098	550	6,506	5,435
Round iron and steel wire	315	388	1,673	1,686
Flat wire and strip steel	132	90	835	521
Wire rope and strand	166	115	873	882
Other wire	131	126	517	1,004
Hoops and bands	1,868	1,842	9,446	10,259
Nails, tacks, and staples	1,198	339	4,701	3,707
Bolts, nuts, and rivets	1	22	167	161
Other finished steel	37	56	1,379	327
Rolled and finished steel	*10,074*	*11,605*	*58,659*	*64,638*
Cast iron pipe and fittings	4	190	11	576
Castings and forgings	161	172	866	666
Total	17,676	52,805	185,314	205,065

*Manganese content only.
†Chromium content only.
‡Silicon content only.

UNITED STATES imports of iron and steel products during July amounted to only 17,676 gross tons, the lowest total in the 10 years over which the Bureau of Foreign and Domestic Commerce of the Department of Commerce has maintained records. In July, 1933, they were 52,805 tons. Exports, on the other hand, rose to 233,186 tons, compared with 219,406 tons in the previous month and with 88,311 tons in July, 1933.

Scrap, as usual, was the chief product exported from a tonnage standpoint, the movement having totaled 155,812 tons. Japan was the principal taker with 101,293 tons, while Italy, Poland and Danzig and the United Kingdom followed in the order named. Tin plate shipments amounted to 13,960 tons, of which Argentina took 2328 tons, Japan 1325 tons, China 1256 tons, and Brazil 1074 tons. Skelp, black sheets, galvanized sheets and seamless steel tubing were the next most important export items.

Pig iron continued as the leading product imported, shipments received having totaled 2997 tons. British India supplied 2352 tons and the Netherlands 536 tons. Of the 2551 tons of ferromanganese imported, 1311 tons came from Norway, 800 tons from Canada and 306 tons from the United Kingdom.

United States Imports of Pig Iron by Countries of Origin

(In Gross Tons)

	July		Seven Months Ended July	
	1934	1933	1934	1933
United Kingdom	50	140	200	5,140
British India	2,352	3,931	20,080	32,699
Germany	....	....	....	234
Netherlands	536	13,471	41,202	36,807
Canada	....	50	4,664	1,006
France	....	....	....	....
Belgium	....	....	50	....
Norway	....	500	962	602
Sweden	....	....	265	2,803
All others	59	147	960	1,775
Total	2,997	18,239	68,383	81,066

Sources of American Imports of Iron and Manganese Ores

(In Gross Tons)

	July		
	Iron Ore		Manganese Concentrates 35 Per Cent or Over
	1934	1933	1934
Canada	44	....	337
*Cuba	22,000	33,000	....
Chile	109,100	21,652	154
Spain	....	196	....
Norway	27,321	....	....
Sweden	15,460	....	....
French Africa	....	....	....
Russia	16,205	17,000	3,933
India	....	....	2,604
Brazil	....	....	1,475
West Africa	6,000	....	1,276
Other countries	....	9,442	14
Total	196,130	81,290	9,793

*July imports of manganese ore from Cuba were 2856 tons.

By G. L. LACHER*
Managing Editor, THE IRON AGE

Opportunism Rules at Washington

Shadow of Coming Elections Puts Political Expediency in the Ascendancy—Clear-cut Policies Are Lacking as Multiplying Complications Enmesh the Recovery Movement

ALL is serene on the Potomac—at least so far as Washington's huge army of Government employees is concerned. General Farley's vigilant eye may account in part for the continued enthusiasm for the New Deal that one finds in the nation's capital. But it does not explain everything. Faith in the recovery program is still very real among the rank and file in Government departments. And the reason is not hard to find. The depression has hit Washington in reverse. All of the buildings on the Administration campus are hives of activity, and there are overflow forces in private structures. Housing is at a premium and the situation promises to grow more acute, as jobs are still to be had.

"Clearance" and What It Means

The speed with which emergency organizations have been created has necessarily put civil service in the eclipse. The only qualification required of an applicant is "clearance." And this consists of getting an "okay" from one's Congressman or Senator—a mere formality in these days when virtually every one is a Democrat of long standing. Of course, there are waiting lists and patience is frequently tried before it is rewarded, but once an applicant is comfortably ensconced in a Government berth, it is not long before he acquires the viewpoint of his associates.

To the jobholder the troubles of private enterprise no longer seem real. No concern is manifested when business falls off—even so irresistible a forward movement as the recovery program must suffer occasional temporary setbacks. Continued labor trouble is dismissed as without significance because business revival has always been accompanied by industrial strife. Complaints of business leaders are discounted as being prompted by selfish motives. In fact, nothing can disturb faith in the New Deal. And that faith is catching. One finds it among many Washingtonians who do not depend on Uncle Sam for their livelihood. Even visitors are not immune. The Washington atmosphere is different.

The Handout Business

Certainly no one from the provinces can help being impressed by the magnitude of the New Deal program. At least no one who can read. An ever swelling flood of press "handouts" pours forth from the multifarious Government departments and bureaus. So great has this outpouring become that Washington supports a business probably duplicated nowhere else in the world—the collection and delivery of handouts. Some handout collectors are reputed to have 30 to 40 news bureaus as clients.

Just to read and digest these handouts is enough to make a couple of dozen men dizzy. And perhaps that is one reason why so many newspaper men strive to emerge from the ranks of reporters and break into feature writing or interpretation. In that field they can practice verbal calisthenics with zestful abandon, firing pot shots at the great and near great without fear of reprisal. They are beholden to no general, P. M. or otherwise. And no American counterpart of *der Fuehrer* has yet made his appearance on the scene.

But the most interesting, and incidentally the most profitable, outlet for the talents of the graduate journalists is in political prognostication. The economist oracle of the 20's, who read the future by watching the ticket tape in New York, has been superseded by the journalist tipster of the 30's, who gives the "low-down" on what Uncle Sam is going to do next. No city has more writers who profess

* Substituting for resident Washington editor on vacation.

to have "inside" information. Some have set up services that specialize in sending their "dope" to private clients, and one or two of them have done a very clever job.

No "Inside" Information

At the moment these services are having a tough time of it, because there doesn't seem to be any inside information. The policy of the Administration appears to be purely opportunistic. If there is a definite policy it has been sidetracked until the November elections are out of the way. There has been a studied avoidance of moves that would antagonize important political blocs. Any action that would provoke the enmity of organized labor, of the inflationists, or even of the extreme "leftists" is evidently regarded as inexpedient at this time.

That this type of political tight-rope walking is extremely difficult is obvious. A severe test of the President's adroitness was his reaction to the nomination of Upton Sinclair, "ugly duckling" of the New Deal. In agreeing to receive the Socialistic candidate of the California Democrats he avoided offending the radically minded; in proscribing political discussion he propitiated the more conservative factions.

Tories and "Nest Eggs"

Even the so-called Tory is receiving consideration from the Administration—not because the elections are approaching but because of the necessity of refunding $1,725,000,000 in Government securities in September and October. The Administration has been kept busy of late trying to reassure conservative elements after startling them with unguarded statements. One of these pronouncements was the President's declaration in favor of "human" rights in preference to "property" rights. Although doubtless intended as a body-blow to the American Liberty League, it was received coldly by all sober-minded people, whether rich or poor, who have struggled to hold on to property through five long years of business adversity. Human rights are not easily distinguishable from property rights, particularly when the acquisition or retention of property has meant hardship and sacrifice.

The radio address of Secretary Morgenthau was also a shock to conservative opinion. Although, in counting as a Government asset the $2,800,000,000 "profit" from dollar devaluation, he may have wished to allay apprehension over the growth of Governmental debt, he achieved the opposite result by his implied admission of faith in monetary legerdemain as a means of meeting the nation's obligations. The Government bond market weakened and President Roosevelt hastened to explain that there is no immediate intention to use the gold profit for reducing national indebtedness, that it is only a "nest egg" to be disposed of in the indefinite future.

Monetary Uncertainty

The President has been kept busy of late explaining the indiscreet remarks of his cabinet members. The need of explanations is another evidence of the lack of a well defined policy. Such uncertainty is bound to undermine confidence. And waning confidence was not sustained by the resignation of Lewis W. Douglas as budget director of the Administration.

It is possible that there are reasons, and good ones, why the Government cannot commit itself on monetary policy at this time. If the Administration is merely motivated by fears of the political power of the inflationists, it is putting expediency before duty, for there is no greater duty to the public today than to demonstrate that the reins of Government are in strong hands. If, on the other hand, our monetary program must remain fluid because of British manipulation of the pound or prospective devaluation of the franc, then a candid admission of that fact would alone bolster confidence.

A Mounting List of Uncertainties

Monetary uncertainty is only one of many uncertainties. We're on our way, but nobody knows where.

Evidences of dissension in the NRA, with a series of resignations that fail to take . . . A program of code simplification announced by the NRA . . . A "brain trust" proposal to purge all codes of price control features . . . A demand by the shoe industry for elimination of all code restrictions save the three fundamentals of maximum hours, minimum wages and prohibition of child labor . . . The application of the railroads for a 10 per cent rate increase . . . The Navy call for steel bids on an f.o.b. mill basis, an obvious effort to break the steel code and thus to undermine steel prices . . . The ruling of the labor board that the representatives of the majority shall constitute the exclusive agency for collective bargaining, a holding that brings a court test of the constitutionality of the recovery act one step nearer . . . The steel labor board's intimation that it will hold an employee election at the Weirton Steel Co. . . . The textile strike and the probability that Federal relief funds will be used to support the strikers.

A Headache Even for a President

A bewildering array of complications—enough to give even a President a headache. The evil day is approaching when a definite stand must be taken on some of the issues that they are bringing to a head. And it may come before election. Yet one must yield the palm to the President for his presence of mind in taking one quick trick when nobody was looking. He continued the automobile code, merit clause included. Not so bad, considering that the automobile business is showing real staying powers and motor car manufacturers are beginning to make sizable capital expenditures.

Secretary Roper Okays Property Rights

This tacit admission of the importance of giving one of our largest industries a break should be taken to heart by those members of the brain trust who have not yet recognized that the first essential of recovery is to permit business to function. Employment, wages and taxes all come out of business—yes, and profits, too, if and when.

But there is hope in the fact that Secretary Roper, who last week resurrected the word "boom," has now dusted off the long forgotten word "profits." The Roosevelt administration, he assures us, stands squarely behind the principle of *just* profits for private business. It is only necessary, he goes on to say, to protect "property rights and human rights in righteous balance." This was a reassuring statement from the Secretary, and besides don't overlook the adroit way in which he did his chief a good turn by taking the sting out of an inadvertent aspersion on property rights.

When "Human" Rights Stifle Business

But promise must be backed up by performance, and performance to date has not been such as to hearten business. Insistence on human rights, i.e., the rights of labor to keep industry in constant turmoil, has precipitated a real crisis in the recovery movement by causing labor costs to rise too fast. Higher costs mean higher prices and when the purchasing power of the country at large does not rise proportionately, smaller demand and decreased business are inevitable.

This is exactly what has happened in the textile industry. Hours were reduced from 54 to maximum of 40 a week, while wage rates were raised approximately 70 per cent. Prices necessarily rose, and demand suffered. Since mills cannot run without orders, reduced operations and a smaller weekly payroll ensued. What remedy do the textile unions suggest? A further reduction of the maximum work week and still higher wage rates. This, despite the fact that the NRA itself investigated these demands when they were presented in June and found them unwarranted.

The reduction of 10 per cent in steel company salaries is also a telltale indication that NRA has boosted costs too fast. The steel cut did not affect wage earners, and, since it was in the form of a reduction of working time, did not affect basic rates of pay anyhow. One wonders what moves

the NRA will take if the time comes when steel wage rates must be lowered.

The Facts, But Not All the Facts

All of these developments are a severe test of the theory that recovery can be brought about by raising mass purchasing power. And they have been ignored in the public pronouncements of Administration leaders. Although Donald R. Richberg, in his report on the Government's recovery efforts, confined himself to facts, he did not give all the facts, especially the facts about the course of business since July 1, 1934. This omission may be excused on the grounds of political expediency, since the Administration naturally wants to paint the best possible picture for the voters of the country. Certainly in private, members of the NRA, Mr. Richberg included, must recognize the untoward trend of business.

Incidentally Mr. Richberg, despite his radical background and his intemperate criticisms of business at the time that he became associated with the NRA, has "worn well." Industrialists that have had contact with him on code matters have found him eminently fair and reasonable.

Not All Madness on the Potomac

And what is said of Mr. Richberg can also be said of various other officials in the NRA less prominent in its affairs. All is not madness on the Potomac. It is freely admitted that wages and costs may have been boosted too rapidly; also that the purchasing power theory may have failed in part because increased wages went into the payment of debts or into savings.

But confidence in the ultimate success of the recovery program is undiminished. The sharp recession in business and particularly the precipitous drop in steel production from 59 to 19 per cent are dismissed as being due to speculative buying in the second quarter. Naturally no mention is made of the Administration's responsibility, through its monetary moves and its wage program, for the succession of sharp upturns and sharp declines in business volume. The autumn months are counted on to bring at least a fair pickup in business, both because of the operation of seasonal forces and as a reaction from the subnormal activity of the summer.

Durable Goods

No great concern is manifested over the continued torpor of the durable goods industries. One can't build a fire by lighting the top of the pile, it is stated. Artificial methods of stimulating durable goods are therefore bound to fail. The natural way to bring about a revival in capital goods, it is asserted, is to increase the volume of business in consumer products to a point where improvement in plant and equipment is warranted. The automobile industry is cited as one field where this stage is now being reached.

The Case for Code Control

Centralized industrial control is held to be as necessary today as when the recovery act was passed. And this view seems to be shared by numerous industries, despite the effort of the shoe trade and other groups to shake off code restrictions.

The locomotive industry, in a recent appeal to the NRA, complains that without additional code protection it is powerless to resist the demands of the railroads for unfair allowances, credits and discounts. And the steel trade is as firm as ever in the belief that its only salvation lies in open prices. A return to unrestricted competition, it is held, would most certainly restore all of the old evils of secret price chiseling, placing the mills at the mercy of the large tonnage buyers.

The Fly in the Ointment

The one fly in the ointment is the labor problem. It is futile to try to coordinate the different factors that make for a healthy business situation so long as so important an element as labor threatens to get out of control. Union labor continues to insist on shorter hours and higher wage rates and is everywhere attempting to impose the closed shop so that it can enforce its demands.

The Shorter Week and Where It Leads

In the textile industry and elsewhere the shorter week-higher pay program has reduced demand. If, every time business declines, labor should succeed in shortening hours without loss in weekly earnings, the time would come when it would receive a week's pay for no work—*reductio ad absurdum*.

Which reminds one again of Secretary Roper's Labor Day utterance on the need of keeping "property rights and human rights in righteous balance." It is precisely because "human" rights, i.e., labor's power, threatens to get out of hand that propertied interests are so concerned about the future. High-sounding talk about collective bargaining under Section 7a is not convincing when bargaining threatens to become dictation. Who is to bring property rights and human rights back into "righteous" balance if organized labor becomes too powerful?

Europe's Answer

Europe has given the answer. After the war, labor became so powerful in Italy that it seized plants, among them the Fiat automobile works, and attempted to operate them. Fascism was the sequel. In Germany the labor element burdened industry with such heavy "social" charges and loaded the Government with such large public expenditures that fiscal collapse and Hitlerism followed. In the last analysis society must live. If it cannot live without accepting extreme discipline which will enforce a workable balance between human rights and property rights, then dictatorship will come.

The Administration may be aware of this danger, but thus far has taken no steps to avert it. Possibly it hopes that the current epidemic of industrial strife will wear itself out. Or it may accept eventual Government control of labor as an inevitable step in making "planned economy" a fact rather than a mere talking point.

That organized labor itself is at least beginning to sense the threat of a dictatorship is indicated by Matthew Woll, vice-president of the American Federation of Labor, who says:

"Nor can labor look out with reassurance upon the cumbersome, top-heavy bureaucracy that has been built up to administer the New Deal. Bureaucracies, like kings, seldom abdicate when once they have a firm hold on the seats of power."

The Railroads Take Heart

But those who fear a trend toward further Governmental invasion of business have recently been heartened by the intimation, through Raymond Moley, that the Administration has had a change of heart regarding the railroads. Inference: Government ownership no longer contemplated.

By coincidence or otherwise, the carriers have taken steps to improve their position by asking for a rate advance. The efficacy of such a move is, of course, questionable. So many forms of competition exist that it is doubtful whether rates can be advanced much without driving traffic off the rails.

In fact, the recovery of lost traffic is the railroad's greatest current problem. It is a problem that is commanding the best thought not only of the carriers themselves, but of the coordinator's staff and the carbuilders as well.

One important reason for high transportation costs is that the railroads use so much of their power hauling empty equipment. Records of identified cars compiled by the coordinator's office show that only 25 per cent of the weight capacity and only 30 per cent of the volume capacity of the box cars of the country are actually used in traffic. A car half the size of present equipment could handle the same amount of freight.

And records also indicate that the carriers have lost most of the freight traffic of shippers and consignees that lack shipping platforms. Of all the freight handled at the present time 85 per cent is unloaded at the sidings of

consignees and only 15 per cent at team tracks. The extra handling cost involved in trucking to the railroad, unloading from truck to car, and then, at the destination, unloading from car to truck tends to offset the advantage of shipping by rail. Loading and unloading, it has been found, takes up 57 per cent of the time required to move freight from shipper to consignee. The advantages of avoiding this handling have caused fully 50 per cent of the anthracite business to shift from rail to truck transportation.

The truck, unlike the railroad, can deliver from shipper's door to consignee's door. The truck likewise fits the size of the average merchandise shipment better than a freight car, for the trend is toward smaller loads. Buyers, for some years, have been striving to carry smaller inventories, depending on more frequent shipments to keep up their supplies.

A Revolution in Freight Transportation?

These facts are inescapable and have led some students to envision a revolution in railroad freight transportation. Flat cars, it is said, will be the commonest form of equipment in the future, and they will carry truck bodies that will be transferred from and to truck chassis at points of shipment and destination. Already an enterprising trucking company in the East has introduced truck bodies of this sort. They are 20 ft. long, 8 ft. wide and 8 ft. high, weigh 5500 lb., have a capacity of 20 tons, and cost $800 each. Two of them are loaded on a flat car. So far they have been constructed of carbon steel, but no doubt they offer an attractive market for corrosion-resisting materials.

Home Modernization

No less interesting than potential changes in railroad methods is the stimulation to building that may result from the home modernization program inaugurated by the Federal Housing Administration. Under this plan, the Government itself does not lend a single dollar, but it insures the loans of lending agencies, thereby making a low rate of interest possible. Loans are restricted to amounts ranging from $100 to $2,000, and may run for any number of months from one to three years. Interest is on a discount basis. The discount is limited to 5 per cent and repayment of the loan is in equal monthly installments. Since part of the loan is steadily returning to the lender, the interest charge for the lending agency figures out at 9.7166 per cent. Finance companies, heretofore, have had to charge almost twice that rate, besides requiring an initial cash deposit that usually amounts to 25 per cent. The rate of 9.7166 per cent—only 5 per cent discount to the borrower—covers the clerical cost, credit investigation and all other charges incidental to handling the loan.

Skeptics contend that the program will fail because of a continued feeling of insecurity as to income and employment among most prospective borrowers. But the Federal Housing Administration makes the answer that the plan has already taken hold. Although the promotional plan of the FHA has not yet been launched and lending agencies are not required to make reports until 30 days after loans have been made, a total of 600 loans, averaging $498 a loan, had already been reported at the time of writing.

Renovation has also gotten under way on the national capital's most beautiful landmark, the Washington monument. Fully 500 tons of steel pipe scaffolding is being erected around the structure so that its stone facing can be repaired.

NRA Continues Rationalization Program — Other Code Developments

WASHINGTON, Sept. 5.—The National Recovery Administration announced the increase to 10 of its industry divisions, through grouping all textile, apparel, leather and fur codes in one division. The step is a second stage in the program of Administrator Johnson for rationalizing the administration of codes by placing all allied industries together and allocating them, for NRA purposes, to 22 sections.

The new division, containing two of these sections, covers more than 100 codes which represent an enormous segment of the employment, capital investment and production of American industry. It is the second new division resulting from the realinement of codes, the other having brought together in a new Division IX all public utility, communication, land, water and air transportation codes, under Acting Divisional Administrator Leighton H. Peebles.

CORRUGATED ROLLED-METAL CULVERT PIPE

A code of fair competition for the corrugated rolled-metal culvert pipe industry has been approved and becomes effective Sept. 7. Five wage districts are provided by the code, with minimum wages ranging from 40c. to 30c. per hr. The wage districts are similar to those of the steel and iron industry code. There is some interchange of employees between those two industries.

MARINE EQUIPMENT MANUFACTURING

Approval of a code of fair competition for the $5,000,000 marine equipment industry has been announced. The code becomes effective Sept. 6.

Approval was conditioned, however, upon the following provisos: That provisions of Article X, in so far as they prescribe a waiting period between the filing with the code authority and the effective date of revised price lists or revised terms and conditions of sale, are stayed; that provisions of Article X, section 5, be stayed pending further order; and that operation of all the provisions of the code be stayed as to all parties subject thereto in so far as they may apply to the products of the gray iron foundry industry, the non-ferrous foundry industry and the electrical manufacturing industry, during a period of 60 days, during which time the code authorities of the latter and the marine equipment industries shall seek through conferences to adjust their differences regarding the definition of this code.

PLOW MANUFACTURERS

An exemption to 132 members of the Southern Plow Manufacturers Association from wage provisions of the code for the farm equipment industry has been made. The code provides for payment of a minimum wage of 30c. an hr. Under the terms of the exemption, the above manufacturers will be permitted to reduce this rate to 25c.

In allowing payment of the lower rate, the administration emphasizes that it is going no farther than to authorize the payment of the rate prevalent in 1929. It was developed at a public hearing that the average rate for common factory labor had fallen to 15c. an hr. in the petitioners' plants in 1933, so that the 25c. rate now permitted constitutes an increase of 66⅔ per cent in the average wage rate of this section of the industry.

ALLOY CASTING

The National Recovery Administration has announced its approval of an amendment to the approved code for the alloy casting industry, providing that wilfully destructive price cutting is an unfair method of competition and is forbidden. It further provides for the establishment of minimum prices during the period of an emergency. The amendment will take effect in ten days unless good cause to the contrary is shown to the Administrator and a subsequent cancellation order is issued.

PACKING MACHINERY

In order that they may not be prevented from doing their full part in the drought relief program, manufacturers of packaging machinery have been temporarily exempted from compliance with the maximum hours provision of their code of fair competition.

Called upon by the United States Government to process and to package enormous quantities of meat, packers of the country have found themselves faced with a shortage of packaging machinery. Members of the packaging machinery industry directed the attention of the Administration to the situation, and it was ordered that, until Oct. 13, they may work their employees engaged in manufacturing products required for storing meats, fruits and vegetables, a 15 per cent man-hour tolerance above the maximum hours provided by the code for the packaging machinery, industry and trade. It was provided, however, that for all time in excess of 40 hr. a week, or 8 hr. a day, the workers must

be paid at not less than the rate of time and one-half.

STEEL CASTING

Approval of amendments to the code of fair competition for the steel castings industry has been announced. One amendment provides that no agency or sub-division shall sell or offer to sell, any product at a price lower than the price filed by a member of such agency or sub-division. Another provides for the addition of several unfair trade practices to schedule "D" of the approved code, relating only to miscellaneous castings. The two modifications become effective 15 days from Aug. 24, unless good cause is shown to the contrary.

PORCELAIN ENAMELING MANUFACTURING

A uniform method of cost finding and estimating for the jobbing shop subdivision of the porcelain enameling manufacturing industry, a subdivision of the fabricated metal products manufacturing and metal finishing and metal coating industry, was discussed at a public hearing. Presented by Rudolph Staud, Benjamin Electric Co., Chicago, chairman of the divisional code authority, the proposed system is based on certain cost schedules: (1) enameling only (sheet steel); (2) fabricating only (sheet steel); and (3) cast iron enameling (wet processed). These schedules are in terms of total cost per square or linear foot, with differentiations for the size of piece, shape of piece, number of coats of enamel applied and quantity of production.

WIRING DEVICE

A public hearing will be held Sept. 11, on a proposed supplemental code for the wiring device industry presented by the National Electrical Manufacturing Association, claiming to represent 85 per cent of the industry. This industry is a subdivision of the electrical manufacturing industry. It is defined in the code as "the manufacture and/or manufacture for sale of electrical wiring devices, including but without limitation sockets and receptacles, tumbler, toggle, push button and snap switches and their accessories; attachment plugs and connecting outlet devices; cord sets for resale; decorative lighting outfits; fuses and cutouts."

RAILWAY CAR APPLIANCES

A plan of organization and procedure for the trade practice complaints committee of the railway car appliances industry, a division of the fabricated metal products and manufacturing and metal finishing and metal coating industry, has been announced. The members of the committee now authorized to proceed with the adjustment of trade practice complaints are: S. L. Beymer, treasurer, Hutchins Car Roofing Co., Detroit; G. N. DeGuire, president, Ajax Hand Brake Co., New York; C. D. Jenks, president, Chicago-Cleveland Car Roofing Co., Chicago; and A. C. Moore, president, Chicago Railway Equipment Co., Chicago.

STEEL JOIST

The code authority for the steel joist industry has made application to the NRA for approval of its budget for the cost of code administration and for the basis of contribution to same by members of the industry. The total amount of the budget for the period Aug. 1, 1934, to July 31, 1935, is $8,000. The proposed basis of contribution follows:

One dollar per ton of steel joists, nailer joists and special joists outside of the range of simplified practice recommendations R94-30 (exclusive of accessories and/or slab centering materials) invoiced in any month.

The code authority also has applied for termination of Administrative Order X-36, of May 26, 1934. This order now exempts from contributing to the budget of the steel joist industry members of the industry whose principal line of business is embraced in a trade or industry subject to a code other than that for this industry.

CODE AUTHORITIES NAMED

The NRA has announced its recognition of the personnel of the following code authorities:

Roller and Silent Chain (subdivision of the machinery and allied products industry): Frank J. Weschler, Baldwin-Duckworth Chain Corpn., Springfield, Mass.; Brinton Welser, Chain Belt Company, Milwaukee; Guy A. Wainwright, Diamond Chain & Mfg. Co., Indianapolis; James S. Watson, Link-Belt Co., Indianapolis; F. C. Thompson, Morse Chain Co., Ithaca, N. Y.; A. G. Gabrieles, Ramsey Chain Co., Albany, N. Y.; E. F. Emmons, Union Chain and Mfg. Co., Sandusky, Ohio, and A. S. Basten, Whitney Mfg. Co., Hartford, Conn.

Air Valve Industry: A. E. Bastedo, Burnham Boiler Corpn., Irvington, N. Y.; G. E. Cage, American Radiator Co., New York; J. L. Dole, The Dole Valve Co., Chicago; R. H. Hubbard, The Beaton & Cadwell Mfg. Co., New Britain, Conn.; A. H. Magee, New York Air Valve Corpn., New York; C. H. Olmsted, James P. Marsh Corpn., Chicago; H. W. Reis, W. A. Russell & Co., New York, and W. K. Simpson, Hoffman Specialty Co., Inc., Waterbury, Conn.

Wire, Rod and Tube Die Industry: Leslie C. Jacobson, Union Wire Die Corpn.; Victor J. Boulin, Vianney Wire Die Works; F. Durand, Cochaud Wire Die Corpn.; Wm. H. Crze, Standard Diamond Tool Co.; and L. Cahmbre, Balloffet Diamond Wire Dies Co., Inc, all of New York.

ADMINISTRATION MEMBERS TO CODE AUTHORITIES

The NRA has announced appointment of administration members, without vote, to the following industry code authorities:

Charles Alan Brantingham, Chicago, hoisting engine manufacturing industry and hoist builders industry, subdivisions of machinery and allied products industry. Mr. Brantingham is now with Thompson and Lichtner Co., Inc., engineer, Chicago.

J. E. O'Brien, Chicago, railway appliance manufacturing industry and conveyor and material preparation equipment industry. Mr. O'Brien, formerly with the Missouri Pacific, served for 10 years as member of the arbritration Committee of the American Railway Association.

George H. Charls, Watch Hill, R. I., kiln, cooler and dryer manufacturing industry. Mr. Charls has been connected with the steel industry for a number of years, and in 1932 was assistant to the president of the American Iron and Steel Institute.

Castings Orders Off— Barrel Output Lower

WASHINGTON, Sept. 5.—Production of malleable castings declined in July to 23,388 net tons, as compared with 28,340 tons in June, according to 112 concerns reporting to the Bureau of the Census. Shipments dropped from 31,607 tons to 27,591 tons in the corresponding period, while new orders booked were 21,862 tons, as against 24,499 tons.

July output of commercial steel castings by 164 makers was 50,268 tons, compared with 46,131 tons in June. New orders were practically unchanged, having amounted to 41,647 tons in July, as compared with 41,537 tons in the preceding month.

July production of steel barrels was 598,745 units, compared with 701,826 in June, according to the reports of 31 manufacturers. Shipments declined from 696,349 barrels to 608,644. Unfilled orders at the end of the month stood at 727,484, as against 1,001,395 30 days before.

New orders for steel furniture during July, as reported by 32 makers, amounted to $1,910,604, as against $2,089,966 in the preceding period. Shipments declined from $1,045,539 to $863,439. Unfilled orders, as of July 31, stood at $1,047,165, as against $1,044,427 one month before.

Sixty-eight makers of steel boilers reported new orders for 455 units during July, amounting to 377,068 sq. ft. In June 415 units called for 359,759 sq. ft.

Production of range boilers during July, as reported by 18 manufacturers, totaled 33,255 units, against 34,741 units in June. Shipments were 33,746 and 33,180 units, respectively, while new orders declined from 34,627 in June to 33,576 in July.

New Government Buildings

WASHINGTON, Sept. 5.—Plans are out on an addition to the Internal Revenue Building, to cost $2,300,000. About 2000 tons of structural steel, besides some reinforcing steel, will be required. Plans will be completed about Jan. 1 for the new Department of Interior Building, which will cost approximately $10,000,000. It is estimated that 8000 to 10,000 tons of structural steel will be involved.

The Standard Wire Corpn., South San Francisco, has been purchased by the California Wire Cloth Co., Emeryville, Cal. The South San Francisco plant, operating under the direction of Kenneth Davis, will be known as the Standard Wire Division of the California Wire Cloth Co.

Labor Boards Struggle With 7-A Interpretation

WASHINGTON, Sept. 4.—Hearing was held today before Admiral Wiley of the National Steel Labor Relations Board in connection with complaint that the Worth Steel Co. had discharged employees because of their union activity as members of Fidelity Lodge of the Amalgamated Association Iron, Steel and Tin Workers. Counsel for the company put witnesses on the stand to disprove the charges and admission was made by counsel for the union that the company had complied in every way with a ruling of the Philadelphia Regional Labor Board for the reemployment of workers. The case turned especially upon the discharge of John Slater, roller, who was dismissed, according to testimony, because of negligence which resulted in the breaking of a roll. Mr. Slater is president of the lodge. Two witnesses for the union admitted that they had been offered reemployment but did not accept it, claiming they had other work in prospect. Both conceded also that the relief department had continually furnished them orders for grocery supplies, despite the fact that they were no longer employed by the company. Also they said they continue to occupy company houses, receive electric current and other convenienes, all without cost.

A motion was filed by the company for dismissal of the case. Among other claims made it was declared that Section 7-a of the Recovery Act is invalid, and that the resolution setting up the steel board is unconstitutional.

Election at W. Va. Rail

Meanwhile plans have been made to proceed with an order issued on Aug. 29 by the National Steel Labor Relations Board for an election on Sept. 6 of employees of the West Virginia Rail Co., Huntingdon, W. Va., to determine their will in the matter of collective bargaining representation. This is the first election ordered by the steel board to be held under its supervision. The election at Huntington will be under the personal supervision of James F. Dewey, commissioner of conciliation of the Department of Labor and now attached to the steel board.

The board announced that an election of employees of the Apollo Steel Co., previously ordered by the board, was called off upon request of the Apollo Lodge of the Amalgamated Association when the company admitted that the union represented a majority of its employees.

In the petition for an election, filed by Charlton Ogburn in behalf of employees who are members of Liberty Lodge of the Association, it is charged that representatives of the lodge were refused the right of collective bargaining at the plant of the West Virginia Rail Co. and that need for the election was precipitated by the company's action in signing an agreement with the Huntington Steel Workers Association. The association, it is claimed, is a company union.

Majority Representation

The elections take on an added importance in view of recent decision of the National Labor Relations Board which provides for majority representation. One case involved that at the Hopewell plant of the Tubize-Chatillon Co., and the other that of the Houde Engineering Corpn. In both cases organized labor through elections is given the right of collective bargaining for all the workers at the plants. The United Textile Workers of America was selected to represent workers at the Hopewell plant of the Tubize-Chatillon Co., and the United Automobile Workers Federal Labor Union given a similar right at plant of the Houde Engineering Corpn. What action if any either company may take is not known.

Majority representation has been insisted upon by organized labor. But in at least one case, that of the Silk Hosiery Co., in Indiana, where a company union won an election, organized labor insisted upon its own representation nevertheless. The matter of majority representation has been a hotly contested point even within the Washington administration. General Hugh S. Johnson, administrator, and Donald R. Richberg, former general counsel of NRA, last summer, in a joint memorandum, insisted upon the right of minority or even individual representation for purposes of collective bargaining. Also the National Automobile Labor Board plan clearly calls for minority representation as endorsed by President Roosevelt. The policies of this board and that of the National Labor Relations Board therefore are in direct conflict. Since the latter has the authority to determine the question it is assumed the automobile board policy will have to be adjusted to a majority representation plan instead of its existing proportional representation plan. What this may mean remains to be seen seeing that automobile manufacturers have vigorously insisted upon the right of minority representation.

The majority representation plan, of course, can work against organized labor, whereas in so many steel plants organized labor has only a minority of the representation. Yet the apprehension seems to be that with this policy in force it will give stimulus to activity of organized labor and the building up of its forces to majorities in many cases and thus give it a dominating voice in labor policies in steel and other industries.

Possibilities for Machinery Production

WILL the output of American concerns manufacturing machinery increase in line with a gradual upward trend starting at the comparatively low level at which production now stands, or, as a result of new mechanical developments in such fields as television, aircraft, air-conditioning and pre-fabricated houses, will it rapidly expand until it regains predepression levels, and from this higher point continue the upward trend begun in 1922?

This question, the answer to which may involve the financial and productive readjustment of many machinery fabricating firms, is the topic for a study now being launched by the Machinery Division, Bureau of Foreign and Domestic Commerce, in response to many requests recently received for information of this character, according to R. E. W. Harrison, chief of the division.

"If American machinery production, which has been increasing at a comparatively steady pace since the first quarter of 1933, when it reached its lowest level since 1910, continues to rise at the same rate, the companies which are engaged in the manufacture of machinery must adjust not only their productive capacity but also their financial organization—their corporate and bonded indebtedness—to the new and reduced levels, since they are now established and geared to operate at the rate of their former production of 1928 and 1929," Mr. Harrison said.

"If, on the other hand, production of machinery resumes the level of these years within a comparatively short time, no widespread productive and financial reorganization is necessary. The study about to be undertaken by the Machinery Division should throw light on future trends and clarify this situation which is of vital importance to American producers of mechanical appliances. The answer to the question will consist in a careful appraisal of the probable markets and extent of general usage which new and improved mechanical equipment will find."

Recalling the effect which the development of the automobile and of improved farm and industrial machinery had in increasing production in the past decade, Mr. Harrison stated that the study now being initiated would attempt to evaluate the possibilities of accomplishing similar

results from other mechanical products.

In addition to statistics of domestic production of machinery which are not complete, Mr. Harrison cited precise figures of machinery exports as a fair indication of production. The figures show that machinery fabrication increased steadily from 1922 to 1929 on a uniform trend and then declined until 1933. Since the spring of 1933 production has resumed, the upward movement. From a monthly average value of nine million dollars in 1922 exports increased to twenty-one million dollars in 1929, an average increase of $1,200,000 annually. In May, 1933, at a figure of three million dollars, exports again increased until the value for May, 1934, was seven million dollars.

The Machinery Division will attempt to determine whether exports and production will continue this rate of increase from the point at which it now stands or whether rapid advances in such fields as air-conditioning, equipment for small farms, low-priced aviation facilities and modern railroad material will rapidly drive production and exports up to the point which would have been reached had their previous rate continued uninterrupted by the depression. Mr. Harrison expressed the opinion that installation of equipment in machinery producing factories and the corporate debt which those firms assumed were predicated on that higher scale of production and that serious readjustments would necessarily follow if the old level were not reached in a comparatively short time.

Mr. Harrison stated that until the study has been completed it is not possible to foretell accurately the effect of the new fields of machine development, but indicated that innovations of the last few years held promise of rapid expansion. Among these, he stated, are air-conditioning, which is gaining increased favor and which has been most successfully developed in the United States. Other promising items mentioned are safer and more efficient aircraft at a low price range conducive of wide usage, and perfections of Diesel and electric locomotives and streamlined engines and cars. Inexpensive agricultural equipment for installation on small farms, the practicability of which has already been demonstrated, was also held to invite wider markets.

Other fields for mechanical development may be found in low-price housing, in pre-fabricated steel homes, television, less expensive laundry equipment and improved medical and surgical appliances made available at a volume and price which will greatly expand their usage, it was stated.

Indirect aids to increased machinery production and utilization are to be seen and are being constructed on a vast scale by Public Works projects in all but about three counties throughout continental United States, and in the advantages of cheaper and more abundant power resulting from Federal programs such as the Tennessee Valley developments, according to Mr. Harrison.

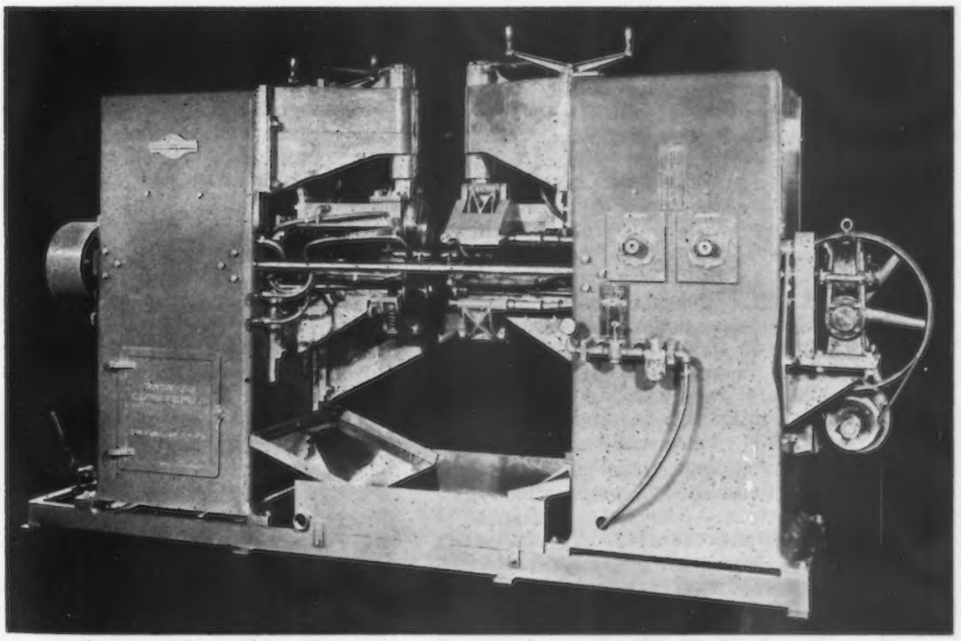
Independent Aluminum Group Protests Code

WASHINGTON, Sept. 5.—The Independent Aluminum Fabricators' Group has filed a formal protest with Gen. Hugh S. Johnson against the selection of a single representative on that industry's code authority. The protesting group has declined to vote for such a member or to give General Johnson their proxies for the election to be held today. They demand a modification of the aluminum code to give the 40 "independents" seven representatives instead of one. Of the eleven association representatives now on the code authority, according to the protest, four have been named by Aluminum Co. of America subsidiaries and seven by the remaining 25 members of the Association of Manufacturers in the Aluminum Industry.

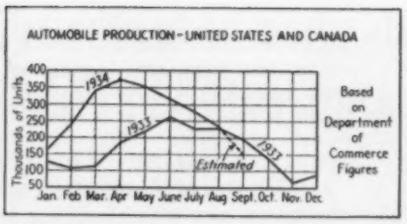
The protest was signed by the Baush Machine Tool Co., Springfield, Mass.; the Aluminum Products Co., La Grange, Ill., and the Sheet Aluminum Corpn., Jackson, Mich.

Railroad Freight Rate Increase Considered

THE application of Class I railroads for increases in freight rates amounting to as much as 10 per cent has created considerable interest in the steel trade. The steel industry would obviously be one of the chief sufferers from increased rates, but, in view of the fact that the railroads are ordinarily large buyers of steel products, comment on the advisability of increased rates is generally withheld. The recent continuous decline in carloadings indicates rather clearly that the carriers must have added revenue if they are to be substantial steel customers.



A DUPLEX seam welder that jons a forging to each end of a tubular shock absorber housing has been developed by the Thomson-Gibb Electric Welding Co. of Lynn. It welds both ends at the same time and each of the two units that make up the complete welder make two welds in series. The machine is equipped with special work holding and aligning fixtures to assure accuracy and a special quick acting tail stock speeds up handling of the work. The welding wheels are driven by friction drives which keep the speed constant regardless of wear.



THIS WEEK ON THE

Retail Car Sales Decline Sharply; Equipment Buying More Active

DETROIT, Sept. 4.

RETAIL automobile sales, which held at surprisingly high levels during June, July and the first half of August, have gone into a tail spin in the last two weeks, upsetting the production plans of some companies for September. Normally sales increase in volume as the month progresses, regardless of the time of the year. This procedure was reversed in August with the result that assemblies of present models may be curtailed this month and next. A leading manufacturer has gone so far as to cancel releases of certain parts for what was to have been its final production run on 1934 cars, cutting down its estimated output by about 20,000 units.

The outlook for the next 60 days is dismal. Operations this month will be sporadic. Several makers probably will close their plants the latter part of September for retooling purposes and will remain virtually idle until Nov. 1 or Nov. 15. At this distance October promises to be the leanest month of the year with some divisions of Chrysler and General Motors chalking up a zero mark in the production column. Ford activities also are likely to be of slim proportions as the Rouge plant prepares for the manufacture of 1935 cars.

There are so many variables to be considered in trying to predict production this month that an accurate estimate is almost impossible. However, unless a miracle happens, the chance is slight that the total will come within striking distance of the 197,608 units turned out in September a year ago. October looks even worse. In that month of 1933 the industry built 138,365 units; this year assemblies should be considerably smaller in volume.

Pontiac Six Delayed

Any hope that fourth quarter production this year may equal or surpass the 285,166 units made in the corresponding quarter of 1933 rests on output from Nov. 15 to Dec. 31. Recent developments indicate that the industry generally will not swing into full operations on new models until at least the middle of November. The Pontiac six, hailed as the first 1935 General Motors entry, has encountered various delays which will push its announcement date back to about Dec. 1. The Pontiac plant is not expected to be assembling the six until the first or second week in November.

It is believed that other General Motors divisions will follow with public presentations in December and January. Plymouth and Dodge, according to reliable reports, should be ready around Dec. 1. Ford's announcement date is anyone's guess. Never has the industry's plans for the immediate future been mode obscure. Each manufacturer is attempting to outguess the other. Programs are intentionally being kept flexible so that sudden shifts in strategy can be made if desired. In some cases one wouldn't miss the mark far by saying that the management itself has not yet decided what its course shall be.

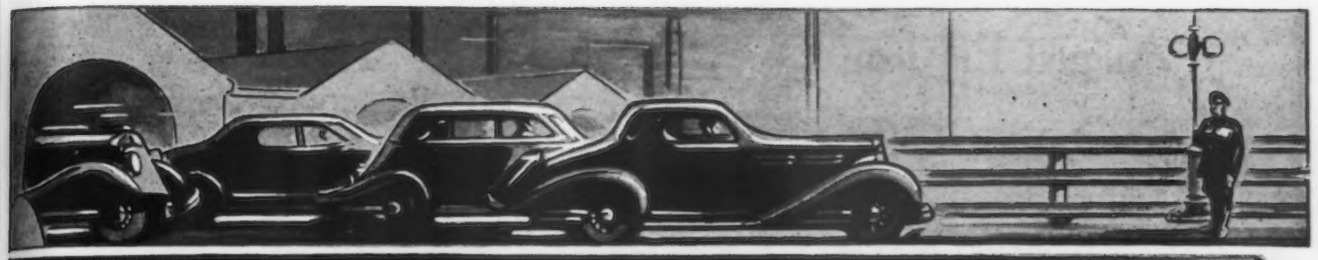
With respect to prices, car makers are on the spot. Under the industry's code, labor costs have risen substantially, and codes of other industries have increased prices of materials. The profit margin per car has dwindled in the last year. However, when manufacturers tried to offset some of their growing costs by means of higher retail prices, buyers rebelled and prices were hastily put back near former levels. Factory list prices in 1935 are almost certain to stay where they are today or go lower. Both Mr. Ford and Mr. Sloan, president of General Motors, are on record in favor of still lower prices if possible. Said the latter recently: "Real selling prices must be reduced. They must be brought within the range of a greater number of buyers. In no other way can industry be stimulated to higher levels of activity. In no other way can the unemployment question be intelligently attacked."

If car manufacturers are to be forced to operate indefinitely on narrow profit margins, close attention will be given to cutting down costs. Production executives today are examining their various operations and processes with an eye toward effecting further economies, and therein lies the hope of machine tool builders for an active market in the coming months.

Packard Places $300,000 Equipment Order

Packard has placed an order with a machine tool company in the Middle West for new equipment for its cylinder block and crankcase line for its light eight. The expenditure for this equipment is reported to be over $300,000. Considerable machinery buying at Packard is in prospect during the coming week. Buick is understood to have purchased machinery and auxiliary equipment costing approximately $70,000.

Divisions of the Chrysler Corpn. are getting ready to buy machine tools for 1935 models. Orders will be scattered among the various plants and



ASSEMBLY LINE

By BURNHAM FINNEY
Detroit Editor, THE IRON AGE

are not expected to total a large figure. They will be mostly to strengthen weak spots in production lines and to conform to the requirements of the few mechanical changes contemplated in Chrysler-made cars. The Chevrolet gear and axle plant in Detroit now is making up a list of tools for which it will put out inquiries shortly. As in the case of Chrysler, Chevrolet is not expected to spend a large sum for new equipment at this time.

Steel Outlook Discouraging

The steel trade, surveying its market in the automobile industry during the next 30 days, has resigned itself to bleak realities. With the sharp drop in retail car sales, there is little likelihood of further steel releases for present models. At the same time most manufacturers are not far enough along with 1935 programs to warrant the release of steel orders for immediate rolling. Fisher Body Corpn. is the notable exception, having placed initial tonnage of sheets the past week for the new Pontiac six. While the amount of business released looked good to mills which recently have been almost devoid of automotive orders, nevertheless the actual tonnage was relatively small.

Large steel buyers are beginning to think about new model requirements. Chrysler Corpn. in the next two weeks will decide where its steel tonnage for the first production run of 1935 cars will be allocated. It is said that Chrysler may not confine its steel business to its present sources. Competition on the part of steel companies for the Chrysler tonnage will be even more severe than in the past. Ford is not likely to buy steel until close to Oct. 1. Steel mills probably will not feel the stimulus of volume buying by the automobile industry until late October.

Ford's Steel Plans Excite Detroit

Ford's plans for its steel mills, revealed in detail for the first time the past week, have caused much comment in Detroit. Local newspapers grew excited over Mr. Ford's venture and began to speculate on the possibility that other automobile companies might make their own steel or perhaps buy existing steel mills. One paper went so far as to publish an interview with Michael Tighe on this subject. Mr. Tighe is reported to have stated that he knows of no plans at present on the part of General Motors or other automobile companies, aside from Ford, to acquire steel properties. The mere thought of Mr. Tighe's qualifying as an authority on this point gave the local steel trade a good laugh.

Ford states that when its steel plant is finished next April it will have an independent supply of the 36 different kinds of special steels which it requires and can produce 3000 cars a day without buying a pound of steel in the market. The capacity of its new mills will be 1500 tons of finished steel a day, giving the Detroit area a steel finishing capacity of 7500 tons a day, if the Newton Steel Co. at Monroe is included. To the east of the present open-hearth and steel mill buildings at Rouge will be a continuous cold strip mill capable of turning out sheets up to 84 in. wide. To the west will be a continuous hot strip mill making strips 48 in. wide. The two buildings, costing $650,000, will house machinery costing more than $6,000,000 and will have 229,400 sq. ft. of floor space. Power equipment to be installed calls for outlay of another $6,000,000. Steel mill equipment will include a 54-in. blooming mill, 500 ft. of continuous pickling tanks and several annealing furnaces. Steel made on the new mills will be used for Ford bodies and frames.

What the steel industry would like to know is whether Ford will operate its new steel mills consistently or use them as a threat to help keep commercial steel prices down. Up to the present time production of steel at Dearborn has been intermittent, the plant having been closed completely when it was advantageous to purchase steel from outside sources. Of course, the Ford investment in steel properties will be far greater than ever before and for this reason the mills may be kept active even when it would appear cheaper to buy steel outside. Many steel men insist that Ford will not be able to make steel as economically as it can be purchased, despite the present expansion program. From sources close to the Ford Motor Co. comes the information that Ford would not have gone into the manufacture of sheets had it not been for the sharp increase in steel prices since the steel code took effect. Ford looks upon the present move as a self-defensive measure.

More Steel for Fisher Bodies

Steel will benefit from the designs of Fisher bodies for 1935 General Motors cars, although it can positively be stated that Fisher has no intention of going to an all-steel body the coming year. The more radical lines of the new cars call for substitution of steel for wood in certain parts, but bodies still will be of composite steel-and-wood construction. A steel roof instead of a fabric covering is reported under consideration, but some problems have to be worked out satisfactorily before this change is made. One problem is the deadening of the noise of a steel roof and another the desirability of having a roof as light in weight as possible.

Ford, Chevrolet and Chrysler are seeking prices on parts for 1935 models. A substantial amount of this business will be allotted in the next two weeks.

Packard on Saturday announced its regular line of eights and twelves for the coming year. The biggest change is in body design with the modern motif of sweeping lines and curves prevailing. Steel has received its first setback in several years in that more wood is used in the new Packard bodies than in 1933 models, the total amount being about 250 lb. The wood plus a stiffer frame and more rigid body mounting is said to give greater riding comfort. The engine has been moved forward and the front axle pulled back. With these improvements Packard decided independent springing was not necessary. The radiator shell still is characteristically Packard although the chrome plated shutter grille is at a sharper angle. Fenders are deeper with front radiator splashers integral with front fenders. Body side panels are continued down to the running board.

(Concluded on Page 58)

August Pig Iron Output Off 13.9 Per Cent

PRODUCTION of coke pig iron in August totaled 1,054,382 gross tons, compared with 1,224,826 tons in July. The daily rate in August, at 34,012 tons, showed a loss of 13.9 per cent from the July rate of 39,510 tons a day. The daily production last month was the lowest since May, 1933, which averaged 28,621 tons.

There were 61 furnaces in blast on Sept. 1, making iron at the rate of 31,295 tons a day, compared with 75 furnaces on Aug. 1, operating at the rate of 35,585 tons a day. Sixteen furnaces were blown out or banked during August and two furnaces were blown in. The Steel Corporation blew out or banked three, independent steel companies blew out or banked nine and blew two in, and merchant producers took four off blast.

Among the furnaces blown out or banked are the following: One Edgar Thomson, of the Carnegie Steel Co.; one Ohio furnace, National Tube Co.; one Fairfield, Tennessee Coal, Iron & Railroad Co.; one Eliza, Jones & Laughlin Steel Corpn.; one Monessen, Pittsburgh Steel Co.; one Cambria, Bethlehem Steel Co.; one Ashland, American Rolling Mill Co.; one Campbell, Youngstown Sheet & Tube Co.; two Haselton, Republic Steel Corpn.; one River, Corrigan, McKinney Steel Co.; one Toledo, Pickands, Mather & Co.; the Globe Iron Co. furnace; one Madeline, Inland Steel Co.; one City furnace, Sloss-Sheffield Steel & Iron Co.; and the Brooke furnace, of the E. & G. Brooke Iron Co.

One Steelton furnace, of the Bethlehem Steel Co., and the Trumbull-Cliffs furnace, of the Republic Steel Corpn., were put in blast.

Daily Average Production of Coke Pig Iron

Gross Tons

	1934	1933	1932	1931
January	39,201	18,348	31,380	55,299
February	45,131	19,798	33,251	60,950
March	52,243	17,484	31,201	65,556
April	57,561	20,787	28,430	67,317
May	65,900	28,621	25,276	64,325
June	64,338	42,166	20,935	54,621
½ year	54,134	24,536	28,412	61,356
July	39,510	57,821	18,461	47,201
August	34,012	59,142	17,115	41,308
September	.....	50,742	19,753	38,964
October	.....	43,754	20,800	37,848
November	.....	36,174	21,042	36,782
December	.....	38,131	17,615	31,625
Year	.....	36,199	23,733	50,069

Production of Coke Pig Iron and Ferromanganese

Gross Tons

	Pig Iron*		Ferromanganese†	
	1934	1933	1934	1933
January	1,215,226	568,785	11,703	8,810
February	1,263,673	554,330	10,818	8,591
March	1,619,534	542,011	17,605	4,783
April	1,726,851	623,618	15,418	5,857
May	2,042,896	887,252	10,001	5,948
June	1,930,133	1,265,007	10,097	13,074
½ year	9,798,313	4,441,003	75,642	47,063
July	1,224,826	1,792,452	10,188	18,661
August	1,054,382	1,833,394	8,733	16,953
September	.....	1,522,257	.....	13,339
October	.....	1,356,361	.....	16,943
November	.....	1,085,239	.....	14,524
December	.....	1,182,079	.....	9,369
Year	.....	13,212,785	.....	136,852

*These totals do not include charcoal pig iron. The 1932 production of this iron was 15,055 gross tons.
†Included in pig iron figures.

Merchant Iron Made, Daily Rate

Tons

	1934	1933	1932
January	7,800	2,602	6,256
February	7,071	2,863	7,251
March	7,197	2,412	7,157
April	8,838	1,908	5,287
May	9,099	3,129	4,658
June	9,499	4,088	6,090
July	7,880	6,783	3,329
August	6,043	7,756	3,070
September	.....	10,034	3,213
October	.....	8,634	4,286
November	.....	7,639	4,435
December	.....	8,358	3,674

Production by Districts and Coke Furnaces in Blast

Furnaces	Production (Gross Tons) Aug. (31 Days)	July (31 Days)	September 1 Number in Blast	September 1 Operating Rate, Tons a Day	August 1 Number in Blast	August 1 Operating Rate, Tons a Day
New York:						
Buffalo	45,685	60,015	3	1,475	3	1,550
Other New York & Mass.	18,338	18,991	2	590	2	615
Pennsylvania:						
Lehigh Valley	26,118	25,333	3	845	3	815
Schuylkill Valley	15,594	21,458	1	485	2	690
Susquehanna and Lebanon Valleys	14,207	13,260	1	1,775	0	....
Ferromanganese	....	....	0	....	0	....
Pittsburgh District	203,633	213,978	10	5,800	13	6,945
Ferro. and Spiegel	16,594	16,416	2	535	2	530
Shenango Valley	17,480	14,374	1	565	1	465
Western Pennsylvania	15,008	14,456	1	485	1	465
Ferro. and Spiegel	4,509	5,980	0	....	1	195
Maryland	35,221	46,738	2	1,135	2	1,085
Wheeling District	65,199	70,115	4	1,845	4	1,930
Ohio:						
Mahoning Valley	81,574	83,571	3	1,710	5	2,650
Central and Northern	99,148	157,283	5	2,420	8	3,640
Southern	13,276	18,566	1	380	2	475
Illinois and Indiana	225,580	241,616	10	6,590	11	7,510
Michigan and Minnesota	58,984	58,027	4	1,905	4	1,870
Colorado, Missouri and Utah	20,240	20,019	2	655	2	645
The South:						
Virginia	.....	.....	0	.....	0	.....
Kentucky	14,744	24,351	1	385	2	785
Alabama	63,340	100,279	5	1,715	7	2,725
Ferromanganese	.....	.....	0	.....	0	.....
Tennessee	.....	.....	0	.....	0	.....
Total	1,054,382	1,224,826	61	31,295	75	35,585

(Concluded from Page 57)

Headlamps are lacquered with chrome rims. Mechanically the cars have been changed little. Aluminum cylinder heads and copper lead connecting rod liners are standard on all models. Exhaust valves are of a new high chrome alloy made by an extruding process by the Detroit Motor Valve Co. Prices are approximately the same as this year's cars.

Local tool and die shops have secured considerable business the past week, and now that the code has been renewed further orders will be placed in the next two weeks for tools and dies for new models. Shops handling large dies are 75 to 80 per cent engaged with enough work ahead to maintain the present operating rate for several months. Most of these larger shops are running two 8-hr. shifts and in some cases a third shift is being employed.

August Pig Iron Production 13.9 Per Cent Below July

Future Course of Output Uncertain—Post-Holiday Losses Offset Gains and Ingot Rate Is Unchanged at 19 Per Cent—Scrap Lower

PIG IRON production in August showed a decline of 13.9 per cent from July following that month's recession of 38.6 per cent from June. The August rate of output, at 34,012 tons daily, was 48.4 per cent below the peak of the year, reached in May, and was the lowest since May, 1933, when the daily average was 28,621 tons.

Total production in August was 1,054,382 tons, compared with 1,224,826 tons in July. There was a net loss of 14 active blast furnaces during the month, 16 having been blown out or banked while two were lighted.

Despite the sharp losses in output in the past two months, production for the year to date is still 50 per cent above the total for the corresponding period in 1933.

WHETHER the current downward trend will continue through September is a question that cannot now be answered with certainty. Improvement in iron and steel bookings since Labor Day has not been impressive, although the final liquidation of stocks accumulated in the second quarter is counted on to drive more tonnage into the market as the month progresses. Further declines in heavy melting scrap at Pittsburgh and Chicago, driving THE IRON AGE scrap composite to $9.75 a ton, a new low for the year, are not encouraging, nor is the general spirit of business unsettlement that has been engendered by chronic labor turmoil climaxing in the nation-wide textile strike.

RAIL programs have been completed at both Chicago and Pittsburgh and rolling of steel for railroad equipment is on a steadily diminishing scale. Automobile production this month will be intermittent and the total will probably fall considerably short of the 197,608 units turned out in September a year ago. The outlook for the remainder of the year is even less promising, but renewal of the automobile code has had the effect of speeding up preparations for production of new models. Considerable business in tools and dies has been placed and the three largest motor car builders are now in the market for parts.

Farmer buying of wire products, usually more active with the approach of fall, has been disappointing, but demand for agricultural implements has improved sufficiently to cause the scheduling of heavier output.

TIN PLATE production is holding at 40 per cent of capacity, although specifications seem to be headed for a seasonal decline. New public projects calling for steel are of unusual size. For the Colorado River aqueduct the Southern California water district will buy 58,000 to 68,000 tons of plates, shapes and reinforcing bars within the next two or three months, with the first opening of bids on Oct. 3. Of the steel to be bought, the concrete bars alone will account for 56,100 tons. Bids on 18,000 tons of reinforcing steel for the Fort Peck, Mont., dam will be taken on Sept. 24.

Structural steel awards, at 9200 tons, including 2485 tons for the Bonneville, Ore., dam, compare with 22,730 tons in the previous week. New structural projects, at 35,750 tons, are the largest since the last week in April.

STEEL ingot production, after slumping sharply over Labor Day, has shown some recovery and the current average, 19 per cent, is unchanged from a week ago. Improvement, however, has been unevenly distributed. The Cleveland-Lorain rate is up 11 points to 24 per cent and the Valley average has risen eight points to 20 per cent, but these increases are offset by recessions of five points to 23 per cent at Chicago, one point to 18 per cent in the Philadelphia area and one point to 9 per cent at Pittsburgh, the last-named rate being the lowest since the July 4 holiday week in 1932. The Detroit average is unchanged at 76 per cent, while the Wheeling district remains on a 24 per cent basis.

STEEL consumers, protected against higher prices until the close of the year by code provisions, are playing a waiting game, in the expectation that present quotations, in the absence of an impressive seasonal upturn in business, will eventually yield to the law of supply and demand. Uneasiness as to the future is clearly manifest in the course of scrap prices and in recent reductions in steel company salaries.

The Navy's effort to break the steel code was unsuccessful. Bids opened on 66 tons of plates on Tuesday disclosed no deviation from code-required delivered prices except by a jobber, which quoted a warehouse price f.o.b. cars or wharf, Pittsburgh. The Navy had asked for bids on a shipping point basis.

THE IRON AGE composite prices for pig iron and finished steel are unchanged at $17.90 a ton and 2.124c. a lb. respectively.

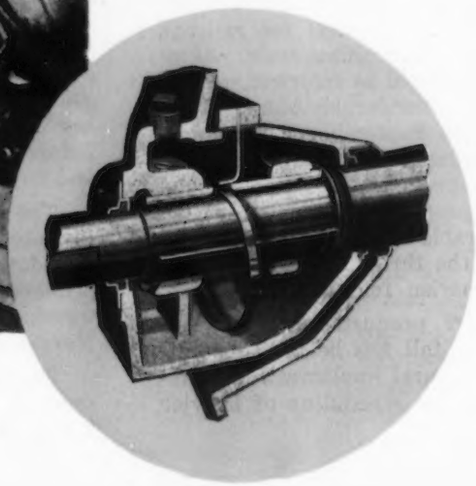
7 YEARS' CONTINUOUS CEMENT MILL SERVICE..

NEARLY 300 WESTINGHOUSE MOTORS IN OPERATION..

ALL EQUIPPED WITH SEALED SLEEVE BEARINGS..

AND THE OIL HAS NEVER BEEN CHANGED..

Above—Motor inspector checking oil level of Westinghouse Sealed Sleeve Bearing Motor in the Lawrence Portland Cement Co. mill at Northampton, Pa. Only a small quantity is added at infrequent intervals.



Sealed Sleeve Bearings defeat the causes of bearing wear. Clean oil is sealed in, dust is sealed out, and the bearing is perfectly lubricated. Wear is negligible.

Blowing out a 5-hp. W inghouse Sealed Sleeve B ing Motor driving the table in the raw grinding partment of the Lawr Portland Cement Co., N ampton, Pennsylvania.

Yet Not one Bearing has been Replaced and all are still in EXCELLENT CONDITION

● Compare this performance of Sealed Sleeve Bearings with that of the older types of sleeve bearings. According to officials of the Lawrence Portland Cement Company, Northampton, Pa., their motor bearings had to be replaced every 12 to 18 months, previous to the installation of Sealed Sleeve Bearing Motors. They installed nearly 300 Westinghouse motors with Sealed Sleeve Bearings and now, after 7 years' service, *not a single bearing has yet been replaced.*

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▲▲▲ A Comparison of Prices ▲▲▲

Market Prices at Date, and One Week, One Month, and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron

	Sept. 5, 1934	Aug. 28, 1934	Aug. 7, 1934	Sept. 6, 1933
Per Gross Ton:				
No. 2 fdy., Philadelphia	$20.26	$20.26	$20.26	$18.34
No. 2, Valley furnace	18.50	18.50	18.50	17.50
No. 2 Southern, Cin'ti	19.13	19.13	19.13	18.23
No. 2, Birmingham†	14.50	14.50	14.50	13.50
No. 2 foundry, Chicago*	18.50	18.50	18.50	17.50
Basic, del'd eastern Pa.	19.76	19.76	19.76	17.84
Basic, Valley furnace	18.00	18.00	18.00	17.00
Valley Bessemer, del'd P'gh.	20.76	20.76	20.76	19.89
Malleable, Chicago*	18.50	18.50	18.50	17.50
Malleable, Valley	18.50	18.50	18.50	17.50
L. S. charcoal, Chicago	24.04	24.04	24.04	23.67
Ferromanganese, seab'd carlots	85.00	85.00	85.00	82.00

†This quotation is for delivery in South; in the North prices are 38c. a ton under delivered quotations from nearest Northern furnace.
*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Rails, Billets, etc.

Per Gross Ton:				
Rails, heavy, at mill	$36.37½	$36.37½	$36.37½	$40.00
Light rails, Pittsburgh	35.00	35.00	35.00	30.00
Rerolling billets, Pittsburgh	27.00	27.00	27.00	26.00
Sheet bars, Pittsburgh	28.00	28.00	28.00	26.00
Slabs, Pittsburgh	27.00	27.00	27.00	26.00
Forging billets, Pittsburgh	32.00	32.00	32.00	31.00
Wire rods, Pittsburgh	38.00	38.00	38.00	35.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.70	1.70	1.70	1.60

Finished Steel

	Cents	Cents	Cents	Cents
Per Lb.:				
Bars, Pittsburgh	1.80	1.80	1.80	1.60
Bars, Chicago	1.85	1.85	1.85	1.65
Bars, Cleveland	1.85	1.85	1.85	1.65
Bars, New York	2.13	2.13	2.13	1.95
Plates, Pittsburgh	1.80	1.80	1.80	1.60
Plates, Chicago	1.85	1.85	1.85	1.65
Plates, New York	2.08	2.08	2.08	1.898
Structural shapes, P'gh	1.80	1.80	1.80	1.60
Structural shapes, Chicago	1.85	1.85	1.85	1.65
Structural shapes, New York	2.05¼	2.05¼	2.05¼	1.86775
Cold-finished bars, P'gh	2.10	2.10	2.10	1.70
Hot-rolled strips, P'gh	1.85	1.85	1.85	1.65
Cold-rolled strips, P'gh	2.60	2.60	2.60	2.25

Finished Steel

	Sept. 5, 1934	Aug. 28, 1934	Aug. 7, 1934	Sept. 6, 1933
Per Lb.:	Cents	Cents	Cents	Cents
Hot-rolled annealed sheets, No. 24, Pittsburgh	2.40	2.40	2.40	2.25
Hot-rolled annealed sheets, No. 24, Gary	2.50	2.50	2.50	2.35
Sheets, galv., No. 24, P'gh	3.10	3.10	3.10	2.85
Sheets, galv., No. 24, Gary	3.20	3.20	3.20	2.95
Hot-rolled sheets, No. 10, P'gh	1.85	1.85	1.85	1.65
Hot-rolled sheets, No. 10, Gary	1.95	1.95	1.95	1.75
Wire nails, Pittsburgh	2.60	2.60	2.60	2.10
Wire nails, Chicago dist. mill	2.65	2.65	2.65	2.15
Plain wire, Pittsburgh	2.30	2.30	2.30	2.10
Plain wire, Chicago dist. mill	2.35	2.35	2.35	2.15
Barbed wire, galv., P'gh	3.00	3.00	3.00	2.60
Barbed wire, galv., Chicago dist. mill	3.05	3.05	3.05	2.65
Tin plate, 100 lb. box, P'gh.	$5.25	$5.25	$5.25	$4.65

Scrap

Per Gross Ton:				
Heavy melting steel, P'gh	$10.75	$11.00	$11.75	$13.25
Heavy melting steel, Phila.	9.75	9.75	10.00	12.00
Heavy melting steel, Chicago	8.75	9.00	9.25	10.00
Carwheels, Chicago	9.50	9.50	9.50	10.50
Carwheels, Philadelphia	11.25	11.25	11.25	12.75
No. 1 cast, Pittsburgh	11.75	11.75	12.25	11.75
No. 1 cast, Philadelphia	11.75	11.75	11.75	12.50
No. 1 cast, Ch'go, (net ton)	8.00	8.00	8.00	10.00
No. 1 RR. wrot., Phila.	11.25	11.25	11.25	12.00
No. 1 RR. wrot., Ch'go, (net)	7.25	7.25	7.25	9.00

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	$3.85	$3.85	$3.85	$2.50
Foundry coke, prompt	4.60	4.60	4.60	3.25

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Electrolytic copper, refinery‡	8.75	8.75	8.75	8.75
Lake Copper, New York‡	9.12½	9.12½	9.12½	9.00
Tin (Straits), New York	51.55	51.70	51.75	45.50
Zinc, East St. Louis	4.20	4.25	4.30	4.70
Zinc, New York	4.55	4.60	4.65	5.07
Lead, St. Louis	3.60	3.60	3.60	4.35
Lead, New York	3.75	3.75	3.75	4.50
Antimony (Asiatic), N. Y.	8.62½	8.62½	8.12½	6.87½

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables. ‡Blue Eagle copper.

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▲▲▲ The Iron Age Composite Prices ▲▲▲

	Finished Steel	Pig Iron	Steel Scrap
Sept. 5, 1934	2.124c. a Lb.	$17.90 a Gross Ton	$9.75 a Gross Ton
One week ago	2.124c.	17.90	9.92
One month ago	2.124c.	17.90	10.33
One year ago	1.959c.	16.71	11.75
	Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products make 85 per cent of the United States output.	Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.	Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel High	Finished Steel Low	Pig Iron High	Pig Iron Low	Steel Scrap High	Steel Scrap Low
1934	2.199c., April 24	2.008c., Jan. 2	$17.90, May 1	$16.90, Jan. 27	$13.00, Mar. 13	$9.75, Sept. 5
1933	2.015c., Oct. 3	1.867c., April 18	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3
1932	1.977c., Oct. 4	1.926c., Feb. 2	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.42, July 5
1931	2.037c., Jan. 13	1.945c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.273c., Jan. 7	2.018c., Dec. 9	18.21, Jan. 7	15.50, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.317c., April 2	2.273c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.286c., Dec. 11	2.217c., July 17	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 2
1927	2.402c., Jan. 4	2.212c., Nov. 1	19.71, Jan. 4	17.54, Nov. 1	15.25, Jan. 11	13.08, Nov. 22

Pittsburgh Operations Fall To 9 Per Cent of Capacity

Valley Output Up Eight Points to 20 Per Cent While Wheeling District Remains at 24 Per Cent—Scrap Declines

PITTSBURGH, Sept. 5.—The local steel industry is virtually marking time. Open-hearth departments and finishing mills were generally inactive over the holiday, and producing records in the current week have suffered. Ingot output in the Pittsburgh district this week will probably average not more than 9 per cent, the lowest production reported since the holiday week of July 4, 1932, when output slumped well below 10 per cent. Production in the Valleys and nearby northern Ohio mills will gain eight points to 20 per cent, while activity in the Wheeling district is unchanged at 24 per cent.

Tin plate operations are holding at 40 per cent. Seamless tube mills are fairly active, as are reinforcing bar mills.

Prospects for improvement are still vague. The expected post-Labor Day improvement has not yet appeared, nor are steel producers inclined now to predict that the fall betterment, if it materializes, will measure up to the usual seasonal upswing. The textile strike, though not directly deterring steel activity here, has nonetheless thrown additional uncertainty into the ranks of steel producers and consumers alike.

The contractual setup under the present code, assuring consumers against higher prices at least until the close of the year, will tend to prevent any sharp fluctuations in buying. Spot business is expected to be the general rule. Although no price revisions for early application next quarter have thus far been reported, it is no secret that steel consumers in many cases are playing a waiting game, with the expectation that present prices will eventually yield to the law of supply and demand.

In the meantime, the speeding up of public works projects has not offset the more pronounced lack of orders from private sources, and producers' backlogs are practically exhausted.

The scrap market is soft, with No. 1 steel at Pittsburgh off 25c. a ton.

Pig Iron

The merchant trade shows no tendency to expand, although seasonal increases in foundry melt are due, and producers expect a slightly quicker movement this month. In the meantime, furnace backlogs have practically been worked off, and producers are uncertain as to future operating schedules. The Neville Island furnace is the sole active merchant stack in this district.

Semi-Finished Steel

Movement of semi-finished grades is very erratic. Sheet bars are possibly an exception, but are not being taken so rapidly as a fortnight ago. The establishing of fourth quarter prices has not uncovered any forward buying by the detached mills, and covering for the coming period is expected to get under way very slowly unless general steel operations tend definitely upward.

Bolts, Nuts and Rivets

The brightest prospect for early tonnage is in the Navy construction program, but in practically all other directions demand is very unimpressive at the moment. Calls from railroad equipment manufacturers are diminishing, and the fourth quarter is not considered likely to provide important tonnage from that source.

Rails and Track Accessories

This market is in the doldrums, with rail and accessory backlogs generally completed on Aug. 31. Reestablishment of third quarter prices for the ensuing quarter will protect carriers against the possibility of higher prices, and railroad purchases are thus expected to be timed according to imperative repair needs and not in anticipation of requirements for the full quarter.

Bars

Demand appears to be drifting, with bar producers unable to predict any change for the next few weeks. Miscellaneous spot needs offer little indication of an immediate seasonal upturn, while the major consuming industries, particularly the automotive group, are indefinite factors in measuring early possibilities for bar tonnage. Producers expect to book very little fourth quarter tonnage in September, and the reestablished 1.80c., Pittsburgh, base for that delivery is likely to be largely nominal.

Reinforcing Steel

This market is rather definitely in contrast to the general steel business from a standpoint of activity. Some mills in this district report a steady expansion in small-lot orders, originating chiefly through public works projects. Specifications are expected here soon on the spillway for the Fort Peck, Mont., dam. Early estimates of reinforcing bar requirements range from 10,000 to 14,000 tons, on which bids will be opened on Sept. 24. Prices appear to be unusually steady, and important producers are free in predicting that no weakness will develop, at least for the time being.

Cold-Finished Steel Bars

The reestablishment of the third quarter quotation for fourth quarter delivery has awakened no forward interest. In the meantime, small orders are dribbling in for spot shipment, and producers will have no difficulty in cleaning up order books by the end of September. A Detroit producer has petitioned under the steel code for the establishment of Detroit as a basing point for cold-finished steel bars.

Plates and Shapes

Although there is a fairly substantial pending tonnage of plates for the Naval construction program, the character of demand in other directions is disappointing. Shipments of plates for car construction are decelerating, while the movement of tank work and barge repairs and construction is extremely limited. Structural awards added little to producers' books in the past week. Fresh structural inquiries are likewise small, with 5000 tons for the Chevrolet Motor Co. assembly plant at Baltimore featuring the list.

Wire Products

Orders have shrunk to the point where some mills are entirely inactive for the week. Unless tonnage is accumulated more quickly than at present, some units will be closed indefinitely. Manufacturers' wire and spring wire are being neglected. Wire fencing and barbed wire, by comparison, are fairly active, but aggregate tonnage is discouragingly small.

Tubular Products

A Pittsburgh independent seamless tube mill will receive a contract from the Bureau of Supplies and Accounts at Washington for 500 tons of seamless boiler tubes for part of the Navy construction program. Fairly large requirements for the remainder of the program are still pending. Specifications will be received here this week on a tonnage of drain pipe for the Fort Peck, Mont., dam spillway, on which bids will be taken Sept. 24.

Interest appears to have been renewed in a long projected pipe line for the Middlesex Pipe Line Co., subsidiary of Sun Oil Co., for a line extending from around Philadelphia to the eastern coast of New Jersey. This line, however, has not been considered economically justified thus far, since very favorable barge freight rates are in effect for delivery to New Jersey ports.

Sheets

Miscellaneous orders in the past week were slightly heavier. Current operations of about 17 per cent, however, reflect rather clearly the generally depressed consumer demand. Forward buying has not yet appeared, and there is little likelihood of any general quarterly contracting for the remainder of the year, since consumers are protected against higher prices under the present code contractual setup.

Tin Plate

A good flow of specifications toward the close of last week has enabled producers to maintain, and, in some exceptional cases, to increase rolling schedules. Losses in other instances offset gains, with the result that average operations for the tin plate industry this week are holding unchanged at 40 per cent. The Government slaughtering program continues to be a source of benefit to some tin plate mills. General specifications, however, are beginning to reflect seasonal recession in packing centers.

Strip Steel

Miscellaneous spot orders are not sufficient generally to permit sustained operations. Some mills operated throughout the past week, but have stopped rolling in the current week pending accumulation of additional orders. Seasonal pickups in various consuming industries have not made their appearance, and the absence of automotive tonnage is being felt keenly by most strip producers.

Coal and Coke

Although this market has not shed its recent drab aspects, prospects for improvement are brighter. Coal producers are now pinning hopes for some tonnage on the prospective last-minute movement for Lake shipment, which will affect largely domestic lump coal and slack. In the western Pennsylvania producing district, output among "captive" mines is being curtailed as a result of the depressed activity in the steel industry. The seasonal stir in domestic coke is becoming more apparent each week. Prices covering important grades of coal and coke remain unchanged.

Scrap

Further weakness has developed in practically all grades, with the list 25c. to 50c. a ton lower. Adjustments to lower price levels, however, are largely nominal, since offers to sell have gone begging in most every case. Steel mills, with an average operating rate of only 9 per cent, are not interested in scrap at any price, and shipments to some mills have been suspended indefinitely. A fair approximation of the market on No. 1 heavy melting steel is $10.50 to $11, although claims of offers at lower than those prices are reported. It is considered doubtful whether brokers would be generally disposed to assume a short position on a round tonnage at the present market prices, despite the generally demoralized condition of the scrap trade. The general belief is that even a moderate buying movement would immediately strengthen the price structure. In the meantime, a more definite appraisal of the important grades may be provided this week when bids on Pennsylvania Railroad scrap are opened. That list covers about 20,000 tons, including approximately 3700 tons of No. 1 heavy melting steel. On the previous Pennsylvania list heavy melting steel was sold at $12.10, but in the present case sharply lower bids will probably rule. The current Baltimore & Ohio list covers 5500 tons including 1500 tons of No. 1 steel.

Demand for Building Steel Up at St. Louis

ST. LOUIS, Sept. 5.—A slight improvement is noted in the specifications against contracts for structural shapes as well as for reinforcing bars. However, demand for other finished steel products is light. August business was especially disappointing to warehouses, having been about 20 per cent less than for July and slightly less than in August last year, the drouth being a contributing factor in the decline.

Only two of seven fabricating plants in the district being operated and they are averaging about 60 per cent of capacity.

Scrap dealers and mills alike continue to mark time, and not much trading is expected until after Sept. 15. No. 1 railroad wrought is 50c. a ton higher in the dealers' list; otherwise the market is nominally unchanged.

The melt of pig iron in stove foundries in the district is holding the increase which occurred in mid-August. Otherwise there is no change in the situation. Buying continues light.

The Bullard Co., Bridgeport, Conn., in the first six months of 1934 operated at a profit of $207,065, whereas in the corresponding period last year it showed a net loss of $236,122. Current assets as of June 30, aggregated $693,059, including $120,851 in cash, while current liabilities were $54,775.

Southern Mills Expect Better Farm Demand

BIRMINGHAM, Sept. 5.—The iron and steel markets remain listless, but steel mills are now looking hopefully to the farm trade for better business. It is felt that with the harvesting of crops there will be a revival of demand for wire products, the extent of which, though, is still uncertain. Books for the fourth quarter were opened Saturday, with all prevailing prices reaffirmed. Not much activity in forward bookings is expected at present.

Large foundries, in the main, are still generously supplied with iron stocks, the consumption in the third quarter not being all that was expected. When the foundries were loaded up with pig iron back in May and June it was thought that shipping channels would again clear toward late August or early September, but such has not been the case and the outlook still lacks promise. Most of the present market activity is provided by small foundries that did not stock heavily and are coming back for small lots as current needs require.

In the last several weeks there have been no changes in blast furnace or open-hearth operations. Five blast furnaces and six open-hearths are producing.

Buffalo Output Off During Holiday

BUFFALO, Sept. 5.—Going into September Buffalo pig iron producers look for somewhat better business, basing their expectations on the assumption that the supply of iron purchased before the July price change must be nearly consumed, compelling foundries still operating to return to the market. Some sales over the past week have been for 100 and 200 tons, though the majority of transactions have been limited to carload lots.

The Lackawanna plant of the Bethlehem Steel Corpn. closed over the week-end and opened after Labor Day with three open-hearths. The Seneca sheet division of Bethlehem was also down, reopening on a 15 per cent basis. Republic Steel Corpn. and Wickwire-Spencer Corpn. were also on somewhat reduced schedules over the holiday.

Local structural steel fabricators received contracts last week as a result of State highway department bridge lettings. One concern got 100 tons for a Chemung County bridge; one, 100 tons for a Franklin County bridge and a smaller award, and a third, 105 tons for a Monroe County bridge.

The scrap market is very dull with no important transactions.

Chicago Rate Off Five Points to 23 Per Cent

Rail Mills Complete Government-Financed Contracts — Scrap Drops to a New Low—Farm Implement Outlook Improves

CHICAGO, Sept. 5.—The three and in many cases four-day holiday has played its usual prank on business, as shown by ingot output, which has dropped five points to 23 per cent of capacity. A part of this drop can be laid at the door of rail mills, which at the turn of the month completed contracts signed on the basis of Government loans. Order mail so far this week has been far from encouraging, specifications having been under the last 30-day average and new sales almost negligible.

Another unsteadying influence came to light late last week when a steel mill succeeded in breaking through scrap prices for a new low on heavy melting steel, at $9 a ton, delivered. The scrap trade is by no means certain that the bottom has been reached and probably will not have assurance until there is some tangible evidence that mill operations will again turn upward.

Wire mills, now several weeks past the time when they can usually count on improved fall business, can find nothing better than a steady but small flow of orders.

A bright spot appears among farm implement manufacturers, who are more cheerful and are contemplating starting heavier production schedules. On the whole, the market picture remains clouded. Most sellers expect some recovery in the fall, but they will not commit themselves on the extent of the expected upward movement.

Pig Iron

Fourth quarter prices became effective Sept. 3, and while some users have signified that they will enter contracts, no definite move in that direction has been made. Spot buying in August was moderately better than in July and sellers are hopeful that September will show further improvement. Chicago interests are still blowing two furnaces, and stocks in the hands of producers are heavier.

Wire Products

The time for the beginning of a fall pickup in business is now several weeks past and there are still no indications of improvement. Fourth quarter prices are in effect, but it is too early to gage the breadth of contracting. Some users have signified their intention to buy ahead, but it is generally believed most consumers will purchase as requirements dictate. Mills are still holding aloof from the jobber-mail order house controversy. They take the attitude that to drop their prices to help jobbers would lead only to still lower quotations by the mail order people. Rains in the West have improved forage crops but have come too late for the grains. So far as Western rural trade is concerned little can be expected of it beyond the small part of Government funds that will find its way into the purchase of wire products. Wire mills are producing at 20 to 25 per cent of capacity.

Sheets

Producers are finding extreme difficulty in accumulating sufficient orders to keep hot mills on uniform schedules. The filing of fourth quarter prices has resulted in no contract business so far and spot orders are widely scattered. The roofing trade, looking ahead to possible help from FHA loans, can expect little from urban centers, but may derive benefit from loans made in rural districts.

Rails

All Government-loan rail contracts are now off the books and only one producer has a schedule which covers a few miscellaneous lots for which money was not borrowed. Another week will see the end of rail rolling, with prospects for resumption very poor. Steel men are of the opinion that railroads will not borrow for rails even if again given the opportunity. Accessory orders are very light.

Bars

Farm implement manufacturers are more cheerful and several of them are making plans to increase operations. Use of bars by automobile manufacturers is steady, though rather light. It is reported that automobile dealers' stocks are in good condition and that not much will be heard this fall of clean-up sales to move old models.

Plates

Some plate tonnage may come from the Illinois Central and the Cambria & Indiana, which have extensive repair programs. Much work is still to be done by the Illinois Central, though its shop work has been going on for some time. The Southern Railway plans to scrap about 5000 units of equipment. Scanty tank news brings to light an award of 250 tons at Goshen, Ind.

Structural Material

A strike has closed three Milwaukee fabricating shops. The fourth shop is operating under an agreement with the union whereby that shop will recognize the union if the other three shops will take the same step.

Both awards and inquiries are light and Chicago fabricators are very much concerned over the outlook. The only two projects of size are dams across the Mississippi River on which bid openings are already behind schedule.

Reinforcing Bars

Chicago dealers are concerned over the fact that a new type of expansion joint proposed for Illinois highway work may eliminate reinforcing bars from slab work. This so-called transload expansion joint consists of sliding steel angles and strip steel and makes no use of bar dowels. On bids taken recently, it was indicated that the new joints will cost $1,800 a mile more than the old type. This is the straw at which bar dealers are grasping. Steel mills have reaffirmed current prices for delivery in the fourth quarter and dealers will follow this lead. Illinois has opened bids on 1000 tons of road work and plans to rush through a large program by the end of the year.

Cast Iron Pipe

Sterling, Ill., and Marathon, Wis., have awarded PWA tonnages, and many similar jobs ranging from 100 to 300 tons are active. Private business is dull. Public utilities, hard pressed by demands for lower rates and by mounting costs, especially taxes, remain out of the market. Cast pipe in sizes 6 in. and larger is firmly established at $47 a ton, delivered Chicago. Opinion seems to favor advances in prices if changes are to be made in the near future.

Scrap

Heavy melting steel prices have been hammered down another 25c. to $9 a ton and the price structure is still wabbly. The inability of dealers to hold accumulations, the recent heavy sales by railroads and the lack of urgent need for scrap by mills are contributing factors. Also, mills are willing to take limited offerings at a price, though it is acknowledged that their receipts are well ahead of consumption and their stock piles are growing. Boat movement of scrap is dormant and practically the full tonnage accumulated on local docks last spring is still to be found there.

Steel Demand Still Lags in New York District

August a Disappointing Month — Tin Plate Releases and Public Works Projects Furnish Only Encouragement — Pipe Jobbers Fined

NEW YORK, Sept. 5.—August was an unsatisfactory month in steel bookings. Although one or two companies showed a gain of as high as 50 per cent over July in orders received in this district, the increases for others ranged from 30 per cent down to zero. In no case were August bookings as large as in the same month a year ago. The current month is too young to throw any light on the possibility of an upturn in demand and the new extras have not been in the hands of sellers long enough to indicate whether they offer an incentive to buyers to place orders for shipment before Oct. 1, when the present extras expire.

Tin plate releases are holding up fairly well, but otherwise the market is very drab, indeed.

Bids will be taken by the Treasury Department in Washington Oct. 2 on a downtown post office, Vesey Street, New York, which will require upward of 25,000 tons of structural steel. Tenders will be received today by the Department of Docks, New York, on a pier shed at the foot of Canal Street, Hudson River, calling for 4500 tons of structural steel and about 400 tons of reinforcing bars. The Lehigh Valley Railroad, which recently applied for PWA funds to repair 1000 box and 1500 coal cars, may ask for additional Government money for the purchase of 500 new freight cars.

Fines have been imposed on several New York pipe jobbers for violation of the jobbers' agreement. The details are withheld. It is not known who was fined or whether the penalties have been collected.

Pig Iron

All customers served by sellers in this district are apathetic to the placing of contracts for fourth quarter iron. About 800 tons was booked last week for delivery during September and the fourth quarter, as compared with 400 tons in the preceding period and 650 tons sold two weeks earlier. In general, sellers expect little improvement in interest for at least another month, and even then the market will probably lag considerably unless general business conditions show signs of definite improvement.

Reinforcing Steel

The aggregate tonnage of small jobs coming into the market here is currently considerably under what is expected for this time of the year. Even less encouraging is the poor outlook for jobs requiring 100 tons or more. No tonnage worthy of special note was placed during the past week, and about the only sizable business in prospect consists of 1100 tons of mesh for miscellaneous highway jobs in New York State on which bids are being opened in Albany today.

Scrap

No. 2 cast and No. 1 machinery cast are being purchased at northern Jersey points at $6.50 and $7.35 a ton respectively, for rail shipment to various smaller foundries in eastern Pennsylvania. However, only occasional carlots of steel are moving from this district. This is only natural, considering the low operating rates of consuming industries. The foreign market continues to be quite firm. There is a considerable volume of inquiry being considered by brokers, and a number of new orders were booked during the past week. No. 1 and No. 2 steels are being purchased at unchanged price levels for shipment to Italy and Japan and a boat is currently being loaded for Poland. The one poor feature of the export market is the continued shortage of boats, as local brokers are having difficulty in securing desirable transportation at rates as low as they have enjoyed in the past.

Dam Tonnages Are Feature on Coast

SAN FRANCISCO, Sept. 4.—Immediate construction of a spillway for the Fort Peck dam, located 25 miles southeast of Glasgow, Mont., is indicated by a call for bids at Kansas City, Mo., by the United States Engineers. Included in the contract are 7000 ft. of channel work and a cut-off structure which will require 18,000 tons of reinforcing bars, 722 tons of steel sealing strips and 130,500 ft. of 6 to 18-in. pipe drains.

Recent steel bookings for the Bonneville dam have been the center of attention in the Pacific Northwest. In addition to the recent award of 12,000 tons of reinforcing bars to the Pacific Coast Steel Corpn. for the powerhouse, navigation locks and bridge piers, 2485 tons of structural steel for this unit was placed with the Pacific Car & Foundry Co. For the spillway dam 6000 tons of reinforcing bars had been previously awarded to Columbia Steel Co. and 2450 tons of structural steel had been booked by the McClintic-Marshall Corpn.

Restricted sales continue to limit mill activity and present industrial demand is not encouraging. No change in mill or warehouse prices has been reported. Bids are expected to be taken soon for a live stock building at San Mateo, Cal., a psychopathic ward at San Francisco and for the Colorado River aqueduct near Los Angeles. An unannounced tonnage of cast iron pipe will be required for a high-pressure line at San Francisco.

Upturn in Steel Buying Expected at Cincinnati

CINCINNATI, Sept. 5.—The continued dullness of the district sheet market was emphasized by the intervening holiday. Both bookings and inquiries have been small. In fact, rolling schedules of 20 per cent of capacity are sufficient to insure shipment of all business received. Automobile makers are merely placing fill-in orders, while other consumers are covering for urgent needs only. Despite any tangible basis for the feeling, mills continue to forecast better demand later in the month. Prices have been reaffirmed for fourth quarter.

In the pig iron market activity is confined to single carload orders. Any increase in melt is certain to stimulate purchases since only a few of the larger interests are carrying sufficient inventory to meet sudden requirements. Foundry operations generally are so low as to make an estimate of the average impossible. In some outlying portions of the district one to two heats a month are reported while in the city one to three heats a week are indicated. Pig iron prices are unchanged.

Foundry coke shipments are low. Difficulty with price provisions in the retail solid fuel code has unsettled the domestic market and dealers are looking to a code hearing this month to bring relief.

The scrap market is without activity. Mill interests are making no new purchases and are merely taking shipments against prior contracts. Despite good yard supplies and the dull market, there is virtually no distress material available.

How's this for Service on FLANGED PRODUCTS?

ORDER FOR PLATES AND HEADS
FOR FORTY 64-INCH DIA. TANKS
RECEIVED AT 1⁰⁰ P.M. FRIDAY
COMPLETE ORDER SHIPPED AT
6⁰⁰ P.M. SATURDAY

EARLY Friday afternoon, when he placed the order, the buyer emphasized, "I've got to have the material Monday morning."

Slabs of the desired analysis were available, but the plates had to be rolled, discs cut out, the heads flanged and dished, and the entire shipment loaded on the cars in but little more than a day.

No special procedure in the usual Bethlehem service was necessary to accomplish this. The order was handled in the regular way. Our flanging shop, the plate mills, and the steel-making units that feed them are geared for speed in handling orders. Not only plate mills, but open-hearth furnaces, even blast furnaces, are located almost within a stone's throw of the flanging shop, under the same management. That's why so many buyers of Flanged and Dished Heads turn to Bethlehem when they want them in a hurry.

BETHLEHEM STEEL COMPANY, General Offices: Bethlehem, Pa.

District Offices: Atlanta, Baltimore, Boston, Bridgeport, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Detroit, Houston, Indianapolis, Milwaukee, New York, Philadelphia, Pittsburgh, St. Louis, St. Paul, Washington, Wilkes-Barre, York. *Pacific Coast Distributor:* Pacific Coast Steel Corporation, San Francisco, Seattle, Los Angeles, Portland and Honolulu. *Export Distributor:* Bethlehem Steel Export Corporation, New York.

Operations Again Decline In Philadelphia District

Steel Production Now at 18 Per Cent of Capacity, with Business Showing No Change—Radio and Stove Makers Fairly Busy

PHILADELPHIA, Sept. 5.—Finished steel orders in this district have failed to show any improvement, following the Labor Day holiday. However, it is too early to make any estimate of September demand, and mills are still hopeful that a gradual limited improvement will make itself felt before the end of the month. The steel inventories of both jobbers and manufacturing consumers seem to be adequate to meet September requirements. By the close of the month, however, consumers are likely to require fill-in lots and a gradual resumption of normal requirement buying might be expected.

Steel ingot production in the district has failed to recover from the pre-holiday suspension of activity. One plant which was inactive last week has resumed production at the same rate which prevailed earlier in the month, but curtailment elsewhere has brought the district's output down to 18 per cent of capacity, compared with 19 per cent in the preceding week. Finishing mill schedules are intermittent and scarcely any units are running every week.

Shipbuilders in this district have allocated most of the steel required for the naval vessels awarded recently, but formal awards are not expected in the near future. The Navy Department has not yet asked for bids on the steel for the ships to be built in its own yards.

Railroad business is lacking and the Pennsylvania has no definite plans for freight car construction or repairs in its own shops.

Pig Iron

The large buyers in this district are well stocked with iron and only the relatively small consumers are showing any disposition to place fourth quarter contracts. The Troy, N. Y., maker has been shipping relatively large tonnages to two or three sizable consumers and some foreign iron is still coming into the district. No change is apparent in the average foundry melt.

Sheets and Strip

Makers of stoves and radios are the leading consumers of flat-rolled steel products in this district. The other major outlets are inactive, although makers of stampings and automobile bodies are preparing dies in anticipation of fall business. Jobber demand is still negligible.

Bars, Plates and Shapes

Structural steel and reinforcing bar awards continue to be small and there is little sizable inquiry before the trade. Highway construction in both Pennsylvania and New Jersey is expected to go on throughout the fall, but the aggregate business for the year to date has not been up to expectations. The plate market is still featured by naval activity, and at least one large private builder is reported to have allocated the steel required for a cruiser. Formal awards may be postponed for several weeks. At the same time the Navy Department may be expected to ask for bids on the plates and shapes needed for the construction of ships in its own yards. Demand for plates from private sources is very quiet. The Pennsylvania Railroad has no definite plans for freight car construction and repairs in its own shops during the fall and winter.

Imports

The following iron and steel imports were received here last week: 2069 tons of pig iron from the Netherlands and 632 tons of the same product from British India; 462 tons of chrome ore from Portuguese Africa; 95 tons of steel tubes, 15 tons of steel bars and 1 ton of steel forgings from Sweden, and 40 tons of iron tubing and 11 tons of manganese ore from Germany.

In the previous week the following imports were received: 5014 tons of chrome ore from Cuba, 550 tons of ferromanganese from Norway, 203 tons of iron ore from Spain, and 37 tons of steel bars and 37 tons of steel bands from Belgium.

Scrap

Buying by a number of users in the latter part of August has left the market inactive. Prices are unchanged with the exception of adjustments made necessary by reductions in the base grades in the preceding week. Export demand is well sustained, but domestic consumers are showing little if any interest in the market.

Textile Strike Affects Boston Scrap Market

BOSTON, Sept. 5.—Reported weakness in No. 1 heavy steel at Pittsburgh prices has not been reflected in Boston for the reason no Pittsburgh delivery market exists here. The American Steel & Wire Co., Worcester, Mass., has dropped its offer for bundled skeleton and similar material from $4.55 a ton, on cars, to $3.80, and has obtained some material. As that company is the sole outlet for skeleton, the market can be considered lower. The DuPont interests have stopped taking chemical borings as a result of the textile strike, leaving only one other consumer open to sellers, at reduced prices. Exporters are buying No. 2 steel, automobile scrap, etc., for shipment from Boston this month at around $6.50 to $6.75 a ton, delivered alongside, and part of a cargo also will be loaded this month at Providence, R. I. The Norwegian motorship Eli, which left Boston Aug. 31 with 4500 tons of scrap for Japan, called at Philadelphia to take on 2800 tons additional. Japan will use this scrap for steel plates and armament. In the pig iron market, Buffalo and other furnaces opened their books Sept. 1 for fourth quarter business, and the Mystic Iron Works did so yesterday, but pig iron buyers are conspicuous by their absence. Past week's sales were almost at the zero point. Foundries insist they can purchase Dutch iron for less than domestic because differentials on the former are disregarded.

Several sizable PWA water projects are expected to mature this month.

Scrap Mart Has Good Tone in Detroit

DETROIT, Sept. 5.—Although the amount of scrap coming onto the market is the least in several months, prices are showing no inclination to move up. In fact, scrap lists closing this week are bringing slightly less than in August. This week the first boatload of scrap to go out of Detroit since July will be dispatched to a Lake Erie port for delivery to a steel mill. Shipments on most orders from steel mills in the Valleys still are being held up.

Output Up 11 Points in Cleveland-Lorain Area

Demand Still Limited to Small Lots—Iron Ore Shipments Decline, With Further Curtailment Indicated for This Month

CLEVELAND, Sept. 5.—Ingot output in the Cleveland-Lorain territory has been stepped up 11 points to 24 per cent of capacity by the starting up Tuesday of five open-hearth furnaces in Lorain by the National Tube Co., whose plant has been shut down three weeks. One Lorain blast furnace also has resumed operations, as well as one Bessemer converter. The latter will be operated intermittently.

Miscellaneous orders for steel continue fairly numerous, but the demand is still confined to small lots. Plants in metal-working industries are maintaining low operating schedules, with little indication of an early improvement, and steel stocks are not being used up very rapidly. However, September volume is expected to show a fair increase over August.

New demand from the automotive industry is virtually at a standstill, but sheet and strip mills hope for some improvement from this source in the latter part of the month. However, no round-lot orders from the motor car manufacturers are expected until they place steel for new models.

Finishing mill operations are intermittent. With no backlogs, frequent shutdowns are necessitated to await an accumulation of orders.

With producers' books now open for the fourth quarter at the reestablished prices, consumers are showing no interest in contracts. Most consumers of bars, plates and shapes placed contracts for the current quarter, but there was little contracting in sheets and strip.

Present discounts on bolts and nuts and small rivets have been reestablished for the fourth quarter and no change is expected on large rivets, although a price announcement has not been made in respect to the latter.

Pig Iron

Producers started this week to solicit fourth quarter contracts at the reestablished prices, and while there appears to be no particular incentive for foundries to make contracts, some are expected to cover for their minimum requirements for the quarter. The recent improvement in small-lot sales is being maintained. Orders range from car lots to 200 tons, buyers of the larger lots usually releasing a car for immediate shipment. The slowing down of the automotive industry is being felt by foundries making motor car castings and these are taking little iron.

Bars, Plates and Shapes

Structural awards during the week include 476 tons of shapes for extensions to Ohio plants, the first private work of any size to be placed in this territory for some time. The general contract for the Toledo Y.M.C.A. building, requiring 800 tons of shapes, has been placed, and a Buffalo district fabricator is the low bidder on the general contract for an Ohio highway bridge requiring 468 tons. There is little new inquiry for fabricated shapes and reinforcing bars. Miscellaneous orders for small lots of bars, plates and shapes continue fairly plentiful but all are for small lots.

Sheets

The slight improvement in the demand reported last week has not been maintained. However, encouragement is found in reports from some consumers that their stocks are running low and that they expect to place new orders shortly. Virtually no business is coming from the automotive industry. Stamping plants continue to get inquiries from motor car manufacturers for parts for new models, but none of this business seems to have been placed as yet. Electrical sheets have become more active. Makers of metal signs are quite busy.

Strip Steel

New demand is almost negligible. Some of the mills have completed shipments against orders placed recently by the automotive industry and are depending on accumulation of small-lot business to permit intermittent operation. New orders are expected from some of the automobile accessory plants the latter part of the month.

Iron Ore

Ore shipments from the upper Lake ports during August were 4,161,686 tons, a decrease of 270,454 tons from July. The August movement was 939,016 tons less than in the same month last year. The movement up to Sept. 1 was 15,685,211 tons, an increase of 4,889,813 tons, or 45.30 per cent, over the corresponding period last year. With reduced steel plant operations, quite a few consumers have made late cuts in their schedules of ore shipments and the movement this month will show a downward tendency. Recent estimates gave 25,000,000 tons as the minimum movement this year. However, it now seems doubtful if the season's movement will total that figure.

Bolts, Nuts and Rivets

Present discounts of 70 per cent off list for bolts and nuts and 70 and 5 per cent for small rivets have been reaffirmed for the fourth quarter. Makers of large rivets have not yet named prices, but no change from the price of $2.90 per 100 lb., Cleveland or Pittsburgh, is expected. Present discounts have also been reestablished on cap and set screws for the quarter. While demand from the automotive industry is at present tapering, makers are hopeful of a fair volume of fall business. Some revival in orders is looked for from jobbers, who have placed scarcely any business since they put in stocks last June.

Scrap

There is no new consumer demand and this is reflected in price weakness, although quotations are unchanged. Dealers are buying small quantities of blast furnace scrap for shipment to a local consumer against old orders. A Cleveland steel plant received a 5000-ton cargo of steelmaking scrap from Duluth during the week.

PWA Allotments to be Felt Throughout Fall

WASHINGTON, Sept. 5.—While the greater part of the funds allotted to the Public Works Administration have been allocated, it has been pointed out that hundreds of projects to be financed from this source have not yet got under way. Highway building in a number of States is still in the planning stage and many other jobs are being held up for various reasons. It is expected that definite activity on many of these projects will be postponed until the winter months when employment will be needed most.

The Union Drawn Steel Co., Massillon, Ohio, will close its general and district sales offices on Saturday mornings until further notice. A skeleton organization will be maintained in all offices in order to take care of pressing business. The company is urging its customers to cooperate in every possible way with the new schedule.

Trade Agreement With Belgium Being Negotiated

WASHINGTON, Sept. 4.—Negotiations for a foreign trade agreement with Belgium are about to be taken up by Acting Secretary of State R. Walton Moore, marking the first negotiations of the kind covering an European country.

Belgium is one of the chief sources of imports of iron and steel into the American market. It is not known what American products may see tariff rates reduced in exchange for concessions by Belgium on American products for export to that country. It is the policy of the department not to announce in advance what the proposal of exchange in concessions will be.

The Committee for Reciprocity Information has announced that all information and views in writing and all applications for supplemental oral presentation of views shall be submitted to the chairman of the committee, in care of the Tariff Commission, not later than Oct. 22. Oral presentation of views by persons whose applications therefore have been approved will be heard Oct. 29.

Imports of some steel items from Belgium into the United States follow:

	1933		1929	
	Quantity	Value	Quantity	Value
Steel bars	33,529,918 lb.	$302,496	25,494,612 lb.	$341,314
Steel ingots, etc.	576,708 lb.	$7,986	28,779,341 lb.	$423,600
Sheet iron and steel saw plates, etc.	15,069,109 lb.	$194,661	12,937,830 lb.	$217,554
Structural steel	45,767,764 lb.	$389,752	159,502,340 lb.	$2,286,271
Pipes, tubes and fittings	312,388 lb.	$3,145	14,203,693 lb.	$344,969
Hoop or band iron or steel	26,569,893 lb.	$270,914	22,807,893 lb.	$436,865
Other iron and steel manufactures	.....	$261,855	.....	$692,775

Among American exports to Belgium were the following:

(By Value)

	1933	1929
Tools	$62,466	$143,769
Other manufactures of iron and steel	220,584	575,456
Refined copper in ingots, bars or other forms	1,010,361	8,372,776
Copper rods	117,596	462,766
"Other" electrical machinery and apparatus	1,448,063	738,633
Metal working machinery	63,467	762,511
Other industrial machinery	496,054	1,228,291
Motor trucks, busses and chassis	984,359	5,144,631
Automobile passenger cars and chassis	4,210,231	12,655,913

▲▲▲ LETTERS TO THE EDITOR ▲▲▲

The Blanket Prescription Is Not a Cure-All

Editor, THE IRON AGE

WHEN Charles P. Steinmetz perfected the principles of alternating current and made possible the distribution of high voltages over appreciable distances, he set into motion a movement of unprecedented importance. His findings and later inventions attendant to it inaugurated what is commonly called the "Power Age," as against that period in technological development known as the "Machine Age." To the disinterested layman who rarely questions the genesis of his electric light, refrigeration, electric driven trains and other results of electric inventions, it may not be of much significance, but to the modern business man it is of inestimable importance. Seventy-five per cent of all American industries are directly dependent upon electricity.

Thus the machine age with its limitless system of gears and belts, its prodigious consumption of floor space, its tremendous steam losses is supplanted by the smooth operation of a series of multiple electric motors acting in perfect synchronization attached to numerous conveyor assemblies which transform the product from its rawest stage into a finished product.

No longer must the production of commodities be fettered to the lagging hands of labor which as Tugwell (The Industrial Discipline) pointed out made the speed of industry dependent upon its least efficient unit—the men who worked the machine. Today, under the rapid progress of technology, labor has become but an incident to the production of commodities. Such a development is and will be inevitable under the terrific impetus of present-day technology.

Invention at Compound Interest

Nor have the various retrenchments of the depression deterred or abated new discoveries. In a recent speech before the second annual convention of the Edison Electric Institute on June 5, Phillip Sporn, vice-president of the American Gas and Electric Company, demonstrated the speed of this trend. "Now, what is the law of all the natural and technological sciences? It is logarithmic, that is, it follows the compound interest law. Invention begets invention, and growth from year to year and from decade to decade takes place upon previously accumulated knowledge. At no time has there been so much research carried out in the scientific and technological laboratories of the world as during the past three years. How, in the face of this, can we possibly talk of technological stability?

This compound curve of inventions bids fair eventually to supplant all forms of physical labor engaged in production, and it is in the preparation for this eventuality that modern engineers and business men are forced to muster all of their mental prowess lest some cataclysmic force ride roughshod over both.

Hitherto, when inanimate machines displaced animate labor, the great hordes of workmen found places in such industries usually designated as service industries. Glass blowers, machinists, laborers, became policemen, barbers, owners of small stores or else were absorbed by the growing bureaucracy of government employees and officials. Hundreds of thousands were absorbed into the professional classes as lawyers, teachers, doctors and nurses. Today the saturation point in those occupations has been neared as evidenced by the increasing numbers of unemployed professionals with decimated incomes.

The "Blanket Prescription"

The problem of reemploying these groups brings me down to the original point of discussion broached by H. P. Losely in the May 24 issue of THE IRON AGE on the merits of "a blanket prescription for shorter hours." Mr. Losely's article was in the nature of a rejoinder to the proposal of Representative Connery of Massachusetts to enact a compulsory 30-hr. week throughout the country.

As this observer understands them, Mr. Losely's most salient contentions in substance are:

1. The skilled and unskilled labor utilized in the creation of new machines partly makes up for those displaced.
2. The life of the machine is brief, hence the high rate of obsolescence.

(Continued on Page 75)

Copper and Tin Show Some Activity; Spelter Declines Another Five Points

Lead Continues Quiet But Price Is Firm at 3.75c.—Zinc Concentrates Decline $1 a Ton as Mines Plan Curtailment

NEW YORK, Sept. 5.—The electrolytic copper market was enlivened by a slight flurry of buying interest late last week and aggregate sales of principal primary sources amounted to over 1000 tons daily during that period. However the market is again in a typically quiet state, with sellers filling occasional carlot orders on the basis of 9c. a lb., delivered Connecticut valley. It is doubtful whether the purchasing of last week indicates any better feeling among copper users. They are under contract for most of their supplies for some distance ahead, and new buying in volume is not expected by the trade until late October. In Europe the market continues to be weak at 7.05c. a lb., c.i.f. usual Continental base ports, with a few sales being booked daily by American interests. As London is about the only remaining open market for copper there has been considerable American metal offered there.

Zinc

Spelter consumers failed to show interest when the price was dropped two weeks ago, and therefore leading sellers made an additional concession of five points last Thursday in an effort to draw some business into the market. This metal is currently quoted at 4.20c. a lb., East St. Louis, and 4.55c., New York, and it is possible that even a lower level might be established in the near future as several sellers are seemingly determined to attract more of the available business in their direction. Only 1300 tons of Prime Western was booked last week by the trade at a price ranging from 4.20c. to 4.25c., as compared with 600 tons in the preceding period and 3780 tons sold two weeks earlier. Notwithstanding the good position of zinc statistically, it is currently suffering from the dull conditions prevailing in consuming industries. Users are uncertain as to what fall activity will be and are therefore hesitant concerning forward zinc purchases and are trying to drive hard bargains. Stocks of concentrates in the Tri-State district are again getting too large for a steady market and mines are consequently striving to curtail production. It is expected that output will drop to around 2500 tons this week as compared with about 8000 tons weekly in the preceding month.

Tin

As the English pound dropped below $5 late last week Straits tin was made available in New York at the lowest price for several months. Domestic users took advantage of the temporary weakness to enter moderate commitments for late fourth and early first quarter deliveries. Sterling rallied after the holiday, and as the price strengthened here the volume of inquiry tapered off rapidly. Currently the market is again quiet at a level around 51.55c. a lb., New York. The spurt of business here was reflected in an advance of about £1 in the London market. Prices there this morning on first call were £228 15s. and £227 15s. for spot and future standard respectively, and £229 2s. 6d. for Straits at Singapore. The tin situation statistically is in itself very strong, and it is only the discouraging outlook for consuming industries in this country that is preventing rises in the world market. The world's visible supplies decreased 840 tons in August and now stand at about 17,936 tons, as compared with 39,624 tons which were available a year ago.

Lead

This commodity is currently quiet, but prices are considered steady at 3.75c. a lb., New York, and 3.60c., St. Louis, in view of the fair volume of business which leading sellers now have on their books. A moderate quantity of metal remains to be placed for September delivery and October is less than 50 per cent sold. Within the past month a few consumers have been buying lead as an investment, and it is the opinion of some sellers that shipments latterly have been considerably in excess of consumption. However the trade hopes that a general business improvement in the fall will take up this slack as well as result in an increase in the volume of fresh business. Such an improvement is extremely desirable as stocks are still mounting and the excess metal now overhanging the market is a decided unsettling factor as regards to buying sentiment.

The Week's Prices. Cents Per Pound for Early Delivery

	Aug. 29	Aug. 30	Aug. 31	Sept. 1	Sept. 4	Sept. 5
Electrolytic copper, N. Y.*‡	8.75	8.75	8.75	8.75	8.75	8.75
Lake copper, Eastern delivery*	9.12½	9.12½	9.12½	9.12½	9.12½	9.12½
Straits tin, Spot, N. Y.	51.45	51.45	51.60	....	51.90	51.55
Zinc, East St. Louis	4.25	4.20	4.20	4.20	4.20	4.20
Zinc, New York	4.60	4.55	4.55	4.55	4.55	4.55
Lead, St. Louis	3.60	3.60	3.60	3.60	3.60	3.60
Lead, New York	3.75	3.75	3.75	3.75	3.75	3.75

*Blue Eagle copper. ‡Refinery price ¼c. higher in Connecticut Valley.

Quotations below cover wholesale lots, f.o.b. New York.

Aluminum, 98-99 per cent, 22.90c. a lb.
Aluminum, remelt, No. 12 (grade 3), 12.75c. a lb., average for week.
Nickel electrolytic cathode, 35c. a lb.; shot and ingot, remelt electro, 36c. a lb.
Antimony, 8.62½c. a lb. Quicksilver, per flask of 76 lb., $75.
Brass ingots, 95-5-5-5, 8.75c. a lb.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig	54.00c. to 55.00c.
Tin, bar	56.00c. to 57.00c.
Copper, Lake	10.25c. to 11.00c.
Copper, electrolytic	10.00c. to 10.50c.
Copper, castings	9.75c. to 10.75c.
*Copper sheets, hot-rolled	16.00c.
*High brass sheets	14.50c.
*Seamless brass tubes	17.00c.
*Seamless copper tubes	17.25c.
*Brass rods	13.00c.
Zinc, slabs	5.75c. to 6.75c.
Zinc sheets (No. 9), casks, 1200 lb. and over	10.25c.
Lead, American pig	4.50c. to 5.50c.
Lead, bar	5.50c. to 6.50c.
Lead, sheets	7.50c.
Antimony, Asiatic	10.00c.
Alum., virgin, 99 per cent, plus	23.30c.
Alum., No. 1 for remelting, 98 to 99 per cent	18.00c. to 19.00c.
Solder, ½ and ½	32.00c. to 33.00c.
Babbitt metal, commercial grades	25.00c. to 60.00c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig	55.75c.
Tin, bar	57.75c.
Copper, Lake	10.00c.
Copper, electrolytic	10.00c.
Copper, castings	9.75c.
Zinc, slab	5.75c. to 6.00c.
Lead, American pig	4.75c. to 5.00c.
Lead, bar	7.75c.
Antimony, Asiatic	9.00c.
Babbitt metal, medium grade	18.50c.
Babbitt metal, high grade	59.75c.
Solder, ½ and ½	33.75c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	6.25c.	7.00c.
Copper, hvy. and wire	6.00c.	6.75c.
Copper, light and bottoms	5.00c.	5.87½c.
Brass, heavy	3.25c.	3.87½c.
Brass, light	2.87½c.	3.50c.
Hvy. machine composition	4.75c.	5.25c.
No. 1 yel. brass turnings	4.37½c.	5.12½c.
No. 1 red brass or compos. turnings	4.25c.	5.25c.
Lead, heavy	2.87½c.	3.37½c.
Zinc	2.25c.	3.00c.
Cast aluminum	9.62½c.	10.75c.
Sheet aluminum	11.00c.	12.50c.

Prices of Finished Steel and Iron Products

BARS, PLATES, SHAPES

Iron and Steel Bars

	Soft Steel	*Base per Lb.*
F.o.b. Pittsburgh		1.80c.
F.o.b. Chicago		1.85c.
F.o.b. Gary		1.85c.
F.o.b. Duluth		1.95c.
Del'd Detroit		1.95c.
F.o.b. Cleveland		1.85c.
F.o.b. Buffalo		1.90c.
Del'd Philadelphia		2.09c.
Del'd New York		2.13c.
F.o.b. Birmingham		1.95c.
F.o.b. cars dock Gulf ports		2.20c.
F.o.b. cars dock Pacific ports		2.35c.

Rail Steel
(For merchant trade)

F.o.b. Pittsburgh	1.70c.
F.o.b. Chicago	1.75c.
F.o.b. Gary	1.75c.
F.o.b. Moline, Ill.	1.75c.
F.o.b. Cleveland	1.75c.
F.o.b. Buffalo	1.80c.
F.o.b. Birmingham	1.85c.
F.o.b. cars dock Gulf ports	2.10c.
F.o.b. cars dock Pacific ports	2.25c.

Billet Steel Reinforcing
(Straight lengths as quoted by distributers)

F.o.b. Pittsburgh	2.05c.
F.o.b. Chicago	2.10c.
F.o.b. Gary	2.10c.
Del'd Detroit	2.20c.
F.o.b. Cleveland	2.10c.
F.o.b. Youngstown	2.10c.
F.o.b. Buffalo	2.10c.
F.o.b. Birmingham	2.10c.
F.o.b. cars dock Gulf ports	2.45c.
F.o.b. cars dock Pacific ports	2.45c.

Rail Steel Reinforcing
(Straight lengths as quoted by distributers)

F.o.b. Pittsburgh	1.90c.
F.o.b. Chicago	1.95c.
F.o.b. Gary	1.95c.
F.o.b. Cleveland	1.95c.
F.o.b. Youngstown	1.95c.
F.o.b. Buffalo	1.95c.
F.o.b. Birmingham	1.95c.
F.o.b. cars dock Gulf ports	2.30c.
F.o.b. cars dock Pacific ports	2.30c.

Iron

F.o.b. Chicago	1.80c.
F.o.b. Terre Haute, Ind.	1.75c.
F.o.b. Louisville, Ky.	2.10c.
F.o.b. Danville, Pa.	1.80c.
F.o.b. Berwick, Pa.	1.80c.

Cold Finished Bars and Shafting*

	Base per Lb.
F.o.b. Pittsburgh	2.10c.
F.o.b. Chicago	2.15c.
F.o.b. Gary	2.15c.
F.o.b. Cleveland	2.15c.
F.o.b. Buffalo	2.20c.
Del'd Detroit	2.30c.
Del'd eastern Michigan	2.35c.

* In quantities of 10,000 to 19,000 lb.

Fence and Sign Posts

Angle Line Posts

	Base per Net Ton
F.o.b. Pittsburgh	$50.00
F.o.b. Chicago	50.00
F.o.b. Duluth	51.00
F.o.b. Cleveland	50.00
F.o.b. Birmingham	53.00
F.o.b. Houston	59.00
F.o.b. cars dock Pacific ports	68.00

Plates

	Base per Lb.
F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
F.o.b. Gary	1.85c.
Del'd Cleveland	1.985c.
F.o.b. Coatesville	1.90c.
F.o.b. Sparrows Point	1.90c.
Del'd Philadelphia	1.985c.
Del'd New York	2.08c.
F.o.b. Birmingham	1.95c.
F.o.b. cars dock Gulf ports	2.30c.
F.o.b. cars dock Pacific ports	2.35c.
Wrought iron plates, f.o.b. P'gh	3.00c.

Floor Plates

F.o.b. Pittsburgh	3.35c.
F.o.b. Chicago	3.40c.
F.o.b. Coatesville	3.45c.
F.o.b. cars dock Gulf ports	3.75c.
F.o.b. cars dock Pacific ports	3.90c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
Del'd Cleveland	1.985c.
F.o.b. Buffalo	1.90c.
F.o.b. Bethlehem	1.90c.
Del'd Philadelphia	2.005c.
Del'd New York	2.0525c.
F.o.b. Birmingham (standard)	1.95c.
F.o.b. cars dock Gulf ports	2.25c.
F.o.b. cars dock Pacific ports	2.35c.

Steel Sheet Piling

	Base per Lb.
F.o.b. Pittsburgh	2.15c.
F.o.b. Chicago	2.25c.
F.o.b. Buffalo	2.25c.
F.o.b. cars dock Gulf ports	2.60c.
F.o.b. cars dock Pacific ports	2.60c.

SHEETS, STRIP, TIN PLATE TERNE PLATE

Sheets

Hot Rolled

	Base per Lb.
No. 10, f.o.b. Pittsburgh	1.85c.
No. 10, f.o.b. Gary	1.95c.
No. 10, del'd Detroit	2.05c.
No. 10, del'd Phila.	2.14c.
No. 10, f.o.b. Birmingham	2.00c.
No. 10, f.o.b. dock cars Pacific ports	2.40c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	2.40c.
No. 24, f.o.b. Gary	2.50c.
No. 24, del'd Detroit	2.60c.
No. 24, del'd Phila.	2.69c.
No. 24, f.o.b. Birmingham	2.55c.
No. 24, f.o.b. dock cars Pacific ports	3.05c.
No. 24, wrought iron, Pittsburgh	4.30c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh	2.50c.
No. 10 gage, f.o.b. Gary	2.60c.
No. 10 gage, del'd Detroit	2.70c.
No. 10 gage, del'd Phila.	2.79c.
No. 10 gage, f.o.b. Birmingham	2.55c.
No. 10 gage, f.o.b. dock cars Pacific ports	3.10c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh	2.95c.
No. 20 gage, f.o.b. Gary	3.05c.
No. 20 gage, del'd Detroit	3.15c.
No. 20 gage, del'd Phila.	3.24c.
No. 20 gage, f.o.b. Birmingham	3.10c.
No. 20 gage, f.o.b. dock cars Pacific ports	3.50c.

Galvanized Sheets

No. 24, f.o.b. Pittsburgh	3.10c.
No. 24, f.o.b. Gary	3.20c.
No. 24, del'd Phila.	3.39c.
No. 24, f.o.b. Birmingham	3.25c.
No. 24, f.o.b. dock cars Pacific ports	3.70c.
No. 24, wrought iron, Pittsburgh	4.95c.

Long Ternes

No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh	3.40c.
F.o.b. cars dock Pacific ports	4.10c.

Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh	3.10c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.75c.
No. 28, Gary	2.85c.
No. 28, cars dock, Pacific Coast ports	3.35c.

Tin Plate *Base per Box*

Standard cokes, f.o.b. P'gh district mill	$5.25
Standard cokes, f.o.b. Gary	5.35
Standard cokes, f.o.b. cars dock Pacific ports	5.90

Terne Plate
(F.o.b. Pittsburgh)
(Per Package, 20 x 28 in.)

8-lb. coating I.C.	$10.00
15-lb. coating I.C.	12.00
20-lb. coating I.C.	13.00
25-lb. coating I.C.	14.00
30-lb. coating I.C.	15.25
40-lb. coating I.C.	17.50

Hot-Rolled Hoops, Bands, Strips and Flats under ¾ In.

	Base per Lb.
All widths up to 24 in., P'gh	1.85c.
All widths up to 24 in., Chicago	1.95c.
All widths up to 24 in., del'd Detroit	2.05c.
All widths up to 24 in., Birmingham	2.00c.
Cooperage stock, Pittsburgh	2.10c.
Cooperage stock, Chicago	2.20c.

Cold-Rolled Strips

	Base per Lb.
F.o.b. Pittsburgh	2.60c.
F.o.b. Cleveland	2.60c.
Del'd Chicago	2.88c.
F.o.b. Worcester	2.80c.

Fender Stock

No. 16 and heavier, Pittsburgh or Cleveland	3.15c.
F.o.b. Worcester	3.55c.
No. 17 and lighter, Pittsburgh or Cleveland	3.30c.
F.o.b. Worcester	3.70c.

Hot-Rolled Rail Steel Strips

	Base per Lb.
F.o.b. Pittsburgh	1.70c.
F.o.b. Chicago	1.75c.
F.o.b. Birmingham	1.85c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

	To Manufacturing Trade Per Lb.
Bright wire	2.30c.
Spring wire	3.20c.

Chicago prices on products sold to the manufacturing trade are $1 a ton above Pittsburgh or Cleveland.

To Jobbing Trade

Qualified jobbers are entitled to a reduction of 20c. a 100 lb. from the base price on carload shipments to stock, and of 10c. a 100 lb. on less-carload shipments to stock.

	Base per Keg
Standard wire nails	$2.60
Smooth coated nails	2.60
Galvanized nails:	
15 gage and coarser	4.60
16 gage and finer	5.10

	Base per 100 Lb.
Annealed fence wire	$2.45
Galvanized fence wire	2.80
Polished staples	3.30
Galvanized staples	3.55
Barbed wire, galvanized	3.00
Woven wire fence, base column	63.00

Chicago and Anderson, Ind., mill prices are $1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is $2 above Pittsburgh); Duluth, Minn., and Worcester, Mass., mill prices are $2 a ton over Pittsburgh (except for woven wire fence at Duluth which is $3 over Pittsburgh), and Birmingham mill prices are $3 a ton over Pittsburgh.

On manufacturers' wire prices at Pacific ports are $9 above the Pittsburgh base. On high-carbon spring wire, prices at Pacific ports are also $9 above Pittsburgh. On wire nails, barbed wire, staples and fence wire, prices at Houston, Galveston and Corpus Christi are $6 a ton over Pittsburgh, while New Orleans and Pacific Coast prices are $8 over Pittsburgh. Exception: on fence wire Pacific Coast prices are $11 a ton above Pittsburgh.

Wire Hoops, Twisted or Welded

	Off List
F.o.b. Pittsburgh	35 and 2½ off
F.o.b. Chicago	35 off

Bale Ties, Single Loop

	Base per Net Ton
F.o.b. Pittsburgh	$63.00
F.o.b. Chicago	64.00
F.o.b. Duluth	65.00
F.o.b. Cleveland	63.00
F.o.b. Birmingham	66.00
F.o.b. cars dock Houston, Galveston, Beaumont, Orange or Corpus Christi, Tex.	72.00
F.o.b. cars dock Pacific ports	74.00

STEEL AND WROUGHT PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

Steel Inches	Black	Galv.	*Wrought Iron* Inches	Black	Galv.
⅛	51½	29½	⅛	+91½	+138
¼ to ⅜	53½	35	¼ & ⅜	+11½	+21½
½	58½	47	½	31½	15
¾	62	52	¾	36½	20½
1 to 3	64	55	1 & 1¼	39½	25½
			1½	43½	28
			2	41½	26

Lap Weld

2	60	51	2	37	22½
2½ to 3	63	54	2½ to 3½	38	25
3½ to 6	65	56	4 to 8	40	28½
7 and 8	64	54	9 to 12	38	24½
9 and 10	63½	53½			
11 and 12	62½	52½			

Butt Weld, extra strong, plain ends

⅛	48½	33½	⅛	+13	+45½
¼ to ⅜	51	38	¼ & ⅜	+2½	+31½
½	56½	47½	½	32½	17½
¾	61	52	¾	37½	22½
1 to 3	63	55	1 to 2	43½	29

Lap Weld, extra strong, plain ends

2	58	50	2	40	26
2½ to 3	62	54	2½ to 4	45½	33
3½ to 6	65½	57½	4½ to 6	45	33½
7 and 8	64½	54½	7 & 8	46	33
9 and 10	63½	53½	9 to 12	41½	30
11 and 12	62½	52½			

On standard steel pipe an extra 5% off is allowed on sales to consumers while two 5's off apply on sales to jobbers. On less-than-carload shipments prices are determined by adding 20 and 25% and the carload freight rate to the base card. On structural steel pipe the base card is reduced 2 points and two 5's off are allowed to consumers and three 5's off to jobbers.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh, in carload lots)

			Cold Drawn	Hot Rolled
1 in. o.d.	13	B.W.G.	$ 8.60	$7.83
1¼ in. o.d.	13	B.W.G.	10.19	9.36
1½ in. o.d.	13	B.W.G.	11.26	10.33
1¾ in. o.d.	13	B.W.G.	12.81	11.64
2 in. o.d.	13	B.W.G.	14.35	13.04
2¼ in. o.d.	13	B.W.G.	16.00	14.54
2½ in. o.d.	12	B.W.G.	19.29	17.54
2¾ in. o.d.	12	B.W.G.	20.45	18.59
3 in. o.d.	12	B.W.G.	21.45	19.50
3¼ in. o.d.	11	B.W.G.	25.22	22.93
3½ in. o.d.	11	B.W.G.	27.09	24.63
4 in. o.d.	10	B.W.G.	33.60	30.54
4½ in. o.d.	10	B.W.G.	41.08	37.35
5 in. o.d.	9	B.W.G.	51.56	46.87
6 in. o.d.	7	B.W.G.	79.15	71.96

Extras for less-carload quantities:

25,000 lb. or ft. to 39,999 lb. or ft.	5 %
10,000 lb. or ft. to 24,999 lb. or ft.	12½ %
2,000 lb. or ft. to 9,999 lb. or ft.	25 %
Under 2,000 lb. or ft.	40 %

Hot-Finished Lapweld Steel Pressure Tubes

(Net base prices per 100 ft., f.o.b. Pittsburgh, in carload lots)

1½ in. o.d.	13	B.W.G.	$ 9.73
1¾ in. o.d.	13	B.W.G.	11.94
2 in. o.d.	13	B.W.G.	12.38
2¼ in. o.d.	13	B.W.G.	13.79
2½ in. o.d.	12	B.W.G.	16.58
2¾ in. o.d.	12	B.W.G.	17.54
3 in. o.d.	12	B.W.G.	18.35
3¼ in. o.d.	11	B.W.G.	21.56
3½ in. o.d.	11	B.W.G.	23.15
4 in. o.d.	10	B.W.G.	28.66
4½ in. o.d.	10	B.W.G.	35.29
5 in. o.d.	9	B.W.G.	44.55
6 in. o.d.	7	B.W.G.	68.14

Quantity Extras:

40,000 lb. or ft.	base
25,000 lb. or ft. to 39,999 lb. or ft.	plus 5 %
10,000 lb. or ft. to 24,999 lb. or ft.	plus 12½ %
2,000 lb. or ft. to 9,999 lb. or ft.	plus 25 %
Under 2,000 lb. or ft.	plus 40 %

CHARCOAL IRON BOILER TUBES

Base Discounts, f.o.b. Pittsburgh

In. O. D.	
1½ and 1¾	44
2 —2¼	13 and 10
2½—2¾	16 and 10
3	17 and 10
3¼—3½	18 and 10
4	20 and 10
4½, 5, 6	21 and 10

Extras for quantity: For 1½ to 1¾, up 8 points under 10,000 lb., up 4 points 10,000 lb. to carload. For 2 in. to 5½ in., up 2 points without supplementary 10 per cent, under 10,000 lb.; supplementary 5 per cent instead of supplementary 10 per cent for 10,000 lb. to carload.

In sizes 2 in. to 4½ in. O.D. inclusive, all tubes more than four gages heavier than standard are priced per lb. as follows: Carload and over, 9c.; extras for quantity—under 10,000 lb. 1c. per lb., 10,000 lb. to carload ½c. per lb.

CAST IRON WATER PIPE

	Per Net Ton
6-in. and larger, del'd Chicago	$47.00
4-in., del'd Chicago	50.00
6-in. and larger, del'd New York	45.00
4-in. del'd New York	48.00
6-in., and larger, Birmingham	39.00
4-in. Birmingham	42.00

Class "A" and gas pipe, $3 extra

RAILROAD MATERIALS

Rails and Track Supplies

F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton	$36.37½
Angle bars, per 100 lb.	2.55

F.o.b. Code Basing Points

Light rails (from billets) per gross ton	$35.00
Light rails (from rail steel) per gross ton	34.00

	Base per 100 Lb.
Spikes, 9/16 in. and larger	$2.40
Spikes, ½ in. and smaller	2.40
Spikes, boat and barge	2.40
Tie plates, steel	1.90
Track bolts, to steam railroads	3.55
Track bolts, no jobbers, all sizes (per 100 count)	70 per cent off list

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Buffalo, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa.; on spikes alone, Cleveland, Youngstown, Lebanon, Pa., Columbia, Pa., Richmond, Va., Jersey City, N. J.

BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List

Machine bolts	70
Carriage bolts	70
Lag bolts	70
Plow bolts, Nos. 1, 2, 3 and 7 heads	70
Hot-pressed nuts, blank or tapped, square	70
Hot-pressed nuts, blank or tapped, hexagons	70
C.p.c. and t. square or hex. nuts, blank or tapped	70
Semi-finished hexagon nuts	70
Semi-finished hexagon castellated nuts, S.A.E.	70
Stove bolts in packages, Pittsburgh	75
Stove bolts in packages, Chicago	75
Stove bolts in packages, Cleveland	75
Stove bolts in bulk, Pgh.	83
Stove bolts in bulk, Chicago	83
Stove bolts in bulk, Cleveland	83
Tire bolts	60

Large Rivets

(½-in. and larger)

Base per 100 Lb.

F.o.b. Pittsburgh or Cleveland	$2.90
F.o.b. Chicago	3.00
F.o.b. Birmingham	3.05

Small Rivets

(7/16-in. and smaller)

Per Cent Off List

F.o.b. Pittsburgh	70 and 5
F.o.b. Cleveland	70 and 5
F.o.b. Chicago and Birm'g'm	70 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lb. on lots of 200 lb. or more)

Per Cent Off List

Milled cap screws, 1 in. dia. and smaller	75, 10 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller	75 and 10
Milled headless set screws, cut thread ¾ in. and smaller	75
Upset hex. head cap screws, U.S.S.S. or S.A.E. thread, 1 in. dia. and smaller	85
Upset set screws, cut and oval point	75 and 10
Milled studs	65

Alloy and Stainless Steel

Alloy Steel Ingots

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem. Uncropped.....$40 per gross ton

Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Base price, $49 a gross ton.
Price del'd Detroit is $52.

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.
Open-hearth grade, base.....2.45c.
Delivered price at Detroit is.....2.60c.

S.A.E. Series Numbers	Alloy Differential per 100 lb.
2000 (1¼% Nickel)	$0.25
2100 (2½% Nickel)	0.55
2300 (3½% Nickel)	1.50
2500 (5% Nickel)	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum) (1.50 to 2.00 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Spring Steel	base
6100 Chromium Vanadium Bar	1.20
4100 Chromium Vanadium Spring Steel	0.95
Chromium Nickel Vanadium	1.50
Carbon Vanadium	0.95

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. The differential for cold-drawn bars is ½c. per lb. higher with separate extras. Blooms, billets and slabs under 4x4 in. or equivalent are sold on the bar base. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base. Sections 4x4 in. to 10x10 in. or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes carry extras.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 2.95c. base per lb.

STAINLESS STEEL No. 302

(17 to 19% Cr, 7 to 9% Ni, 0.08 to 0.20% C)

(Base Prices, f.o.b. Pittsburgh)

	Per Lb.
Bars	23c.
Plates	26c.
Sheets	33c.
Hot-rolled strip	20¾c.
Cold-rolled strip	27c.

Raw and Semi-Finished Steel

Carbon Steel Rerolling Ingots

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham.
Uncropped .....$29 per gross ton

Carbon Steel Forging Ingots

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Birmingham.
Uncropped .....$31 per gross ton

Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham.

Per Gross Ton

Rerolling	$27.00
Forging quality	32.00

Delivered Detroit

Rerolling	$30.00
Forging	35.00

Billets Only F.o.b. Duluth

Rerolling	$29.00
Forging	34.00

Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Per Gross Ton

Open-hearth or Bessemer.....$28.00

Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

Per Lb.

Grooved	1.70c.
Universal	1.70c.
Sheared	1.70c.

Tube Rounds

Base per Lb.

F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
F.o.b. Cleveland	1.85c.
F.o.b. Buffalo	1.90c.
F.o.b. Birmingham	1.95c.

Wire Rods

(Common soft, base)

Per Gross Ton

F.o.b. Pittsburgh	$38.00
F.o.b. Cleveland	38.00
F.o.b. Chicago	39.00
F.o.b. Anderson, Ind.	39.00
F.o.b. Youngstown	39.00
F.o.b. Worcester, Mass.	40.00
F.o.b. Birmingham	41.00
F.o.b. San Francisco	47.00

Pig Iron and Ferroalloys

PIG IRON

PRICES PER GROSS TON AT BASING POINTS

Basing Points	No. 2 Fdry.	Malleable	Basic	Bessemer
Everett, Mass.	$19.50	$20.00	$19.00	$20.50
Bethlehem, Pa.	19.50	20.00	19.00	20.50
Birdsboro, Pa.	19.50	20.00	19.00	20.50
Swedeland, Pa.	19.50	20.00	19.00	20.50
Steelton, Pa.	....	....	19.00	....
Sparrows Point, Md.	19.50	....	19.00	....
Neville Island, Pa.	18.50	18.50	18.00	19.00
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Youngstown	18.50	18.50	17.00	19.00
Buffalo	18.50	19.00	17.50	19.50
Erie, Pa.	18.50	19.00	18.00	19.50
Cleveland	18.50	18.50	18.00	19.00
Toledo, Ohio	18.50	18.50	18.00	19.00
Jackson, Ohio	20.25	20.25	19.75	....
Detroit	18.50	18.50	18.00	19.00
Hamilton, Ohio	18.50	18.50	18.00	19.00
Chicago	18.50	18.50	18.00	19.00
Granite City, Ill.	18.50	18.50	18.00	....
Duluth, Minn.	19.00	19.00	....	19.50
Birmingham	14.50	14.50	13.50	19.00
Provo, Utah	17.50	....	....	....

DELIVERED PRICES PER GROSS TON AT CONSUMING CENTERS

	No. 2 Fdry.	Malleable	Basic	Bessemer
Boston Switching District From Everett, Mass.	$20.00	$20.50	$19.50	$21.00
Brooklyn From East Pa. or Buffalo	21.77	22.27	21.27	22.77
Newark or Jersey City, N. J. From East. Pa. or Buffalo	20.89	21.39	20.39	21.89
Philadelphia From Eastern Pa.	20.26	20.76	19.76	21.26
Cincinnati From Hamilton, Ohio	19.51	19.51	19.01	20.01
Canton, Ohio From Cleveland and Youngstown	19.76	19.76	19.26	20.26
Columbus, Ohio From Hamilton, Ohio	20.50	20.50	....	....
Mansfield, Ohio From Cleveland and Toledo	20.26	20.26	....	....
Indianapolis From Hamilton, Ohio	20.77	20.77	....	....
South Bend, Ind. From Chicago	20.55	20.55	....	....
Milwaukee From Chicago	19.50	19.50	....	....
St. Paul From Duluth	20.94	....	....	....
Davenport, Iowa From Chicago	20.26	20.26	....	....
Kansas City From Granite City	21.04	21.04	....	....

Delivered prices on Southern iron for shipment to Northern points are 38c. a gross ton below delivered prices from the nearest Northern basing points.

LOW PHOSPHORUS PIG IRON

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.....$23.50

Johnson City, Tenn.	19.50
Del'd Chicago	25.15

GRAY FORGE PIG IRON

Valley furnace $18.25

CHARCOAL PIG IRON

Lake Superior furnace	$21.00
Delivered Chicago	24.04
Delivered Buffalo	24.28

CANADA

Pig Iron

Per gross ton:

Delivered Toronto

No. 1 fdy., sil. 2.25 to 2.75	$21.00
No. 2 fdy., sil. 1.75 to 2.75	20.50
Malleable	21.00

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75	$22.50
No. 2 fdy., sil. 1.75 to 2.25	22.00
Malleable	22.50
Basic	22.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

Per Gross Ton

Domestic, 80% (carload) $85.00

Spiegeleisen

Per Gross Ton Furnace

Domestic, 19 to 21% $26.00

Electric Ferrosilicon

Per Gross Ton Delivered

50% (carloads)	$77.50
50% (ton lots)	85.00
75% (carloads)	126.00
75% (ton lots)	136.00
14% to 16% (f.o.b.) Welland, Ont. (in carloads) (duty paid)	31.00
14% to 16% (less carloads)	38.50

Silvery Iron

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton		Per Gross Ton	
6%	$22.75	12%	$29.25
7%	23.75	13%	30.75
8%	24.75	14%	32.25
9%	25.75	15%	33.75
10%	26.75	16%	35.25
11%	27.75	17%	36.75

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed.

Bessemer Ferrosilicon

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton		Per Gross Ton	
10%	$27.75	14%	$33.25
11%	28.75	15%	34.75
12%	30.25	16%	36.25
13%	31.75	17%	37.75

Manganese 1½ to 3%, $1 a ton additional. For each unit of manganese over 3%, $1 a ton additional. Phosphorus 0.75% or over, $1 ton additional.

Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Other Ferroalloys

Ferrotungsten, per lb. contained W, del., carloads	$1.33 to $1.45
Ferrotungsten, less carloads	1.45 to 1.55
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr. per lb. contained Cr. delivered, in carloads	19.00c.
Ferrochromium, 2% carbon	16.50c. to 17.00c.
Ferrochromium, 1% carbon	17.50c. to 18.00c.
Ferrochromium, 0.10% carbon	19.50c. to 20.00c.
Ferrochromium, 0.06% carbon	20.00c. to 20.50c.
Ferrovanadium, del., per lb. contained V	$2.70 to $2.90
Ferrocarbontitanium, 15 to 18% Ti, 6 to 8% C, f.o.b. furnace carload and contract per net ton	$137.50
Ferrophosphorus, electric, or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton with $2 unitage	50.00
Ferrophosphorus, electric, 24% f.o.b. Anniston, Ala., per gross ton with $2.75 unitage	65.00
Ferromolybdenum, per lb. Mo., del.	95c.
Calcium molybdate, per lb. Mo., del.	80c.
Silico spiegel, per ton, f.o.b. furnace, car lots	$38.00
Ton lots or less, per ton	45.50
Silico-manganese, gross ton, delivered:	
2.50% carbon grade	90.00
2% carbon grade	95.00
1% carbon grade	105.00
Spot prices	$5 a ton higher

Iron and Steel Scrap

PITTSBURGH

Per gross ton delivered consumers' yards:			
No. 1 heavy melting steel	$10.50	to	$11.00
No. 2 heavy melting steel	9.50	to	10.00
No. 2 railroad wrought	10.50	to	11.00
Scrap rails	10.50	to	11.00
Rails 3 ft. and under	13.50	to	14.00
Compressed sheet steel	10.50	to	11.00
Hand bundled sheet steel	9.50	to	10.00
Hvy. steel axle turnings	9.50	to	10.00
Machine shop turnings	7.25	to	7.75
Short shov. turnings	7.25	to	7.75
Short mixed borings and turnings	7.00	to	7.50
Cast iron borings	7.00	to	7.50
Cast iron carwheels	11.50	to	12.00
Heavy breakable cast	10.00	to	10.50
No. 1 cast	11.50	to	12.00
Railr. knuckles and couplers	13.50	to	14.00
Rail, coil and leaf springs	13.50	to	14.00
Rolled steel wheels	13.50	to	14.00
Low phos. billet crops	13.50	to	14.00
Low phos. sheet bar crops	12.50	to	13.00
Low phos. plate scrap	12.50	to	13.00
Low phos. punchings	13.00	to	13.50
Steel car axles	13.50	to	14.00

CHICAGO

Delivered Chicago district consumers: *Per Gross Ton*			
Heavy melting steel	$8.50	to	$9.00
Automobile hvy. melt. steel	8.00	to	8.50
Shoveling steel	8.50	to	9.00
Hydraulic comp. sheets	7.50	to	8.00
Drop forge flashings	6.75	to	7.25
No. 1 busheling	6.75	to	7.25
Rolled carwheels	10.00	to	10.50
Railroad tires	10.00	to	10.50
Railroad leaf springs	10.00	to	10.50
Axle turnings	8.00	to	8.50
Steel couplers and knuckles	10.00	to	10.50
Coil springs	10.50	to	11.00
Axle turnings (elec. fur.)	8.50	to	9.00
Low phos. punchings	10.00	to	10.50
Low phos. plates, 12 in. and under	10.50	to	11.00
Cast iron borings	5.00	to	5.50
Short shoveling turnings	5.00	to	5.50
Machine shop turnings	4.75	to	5.25
Rerolling rails	10.00	to	10.50
Steel rails, less than 3 ft.	10.00	to	10.50
Steel rails, less than 2 ft.	10.50	to	11.00
Angle bars, steel	10.00	to	10.50
Cast iron carwheels	9.50	to	10.00
Railroad malleable	9.00	to	9.50
Agricultural malleable	7.75	to	8.25

Per Net Ton			
Iron car axles	$12.00	to	$12.50
Steel car axles	10.00	to	10.50
No. 1 railroad wrought	7.00	to	7.50
No. 2 railroad wrought	7.50	to	8.00
No. 2 busheling	3.50	to	4.00
Locomotive tires, smooth	9.00	to	9.50
Pipe and flues	4.50	to	5.00
No. 1 machinery cast	8.00	to	8.50
Clean automobile cast	8.00	to	8.50
No. 1 railroad cast	7.50	to	8.00
No. 1 agricultural cast	7.00	to	7.50
Stove plate	5.25	to	5.75
Grate bars	4.75	to	5.25
Brake shoes	6.00	to	6.50

PHILADELPHIA

Per gross ton delivered consumers' yards:			
No. 1 heavy melting steel	$9.50	to	$10.00
No. 2 heavy melting steel	8.00	to	8.50
No. 1 railroad wrought	$11.00	to	11.50
Bundled sheets	....		9.00
Hydraulic compressed, new	....		9.50
Hydraulic, compressed, old	6.50	to	7.00
Machine shop tuurnings	5.50	to	6.00
Heavy axle turnings	9.00	to	9.50
Cast borings	5.00	to	5.50
Heavy breakable cast	9.50	to	10.00
Stove plate (steel works)	....		8.00
No. 1 low phos. heavy	14.00	to	14.50
Couplers and knuckles	13.50	to	14.00
Rolled steel wheels	13.50	to	14.00
No. 1 blast furnace	5.00	to	5.50
Spec. iron and steel pipe	....		8.00
Shafting	15.00	to	16.00
Steel axles	....		14.50
No. 1 forge fire	....		9.00
Cast iron car wheels	11.00	to	11.50
No. 1 cast	11.50	to	12.00
Cast borings (chem.)	12.00	to	14.00
Steel rails for rolling	....		12.00

CINCINNATI

Dealers' buying prices per gross ton:			
Heavy melting steel	$7.00	to	$7.50
Scrap rails for melting	8.00	to	8.50
Loose sheet clippings	3.50	to	4.00
Bundled sheets	5.50	to	6.00
Cast iron borings	4.75	to	5.25
Machine shop turnings	4.50	to	5.00
No. 1 busheling	6.00	to	6.50
No. 2 busheling	2.50	to	3.00
Rails for rolling	8.50	to	9.00
No. 1 locomotive tires	8.25	to	8.75
Short rails	11.00	to	11.50
Cast iron carwheels	7.50	to	8.00
No. 1 machinery cast	8.75	to	9.25
No. 1 railroad cast	8.25	to	8.75
Burnt cast	5.75	to	6.25
Stove plate	5.75	to	6.25
Agricultural malleable	7.75	to	8.25
Railroad malleable	7.75	to	8.25

CLEVELAND

Per gross ton delivered consumers' yards:			
No. 1 heavy melting steel	$8.50	to	$9.00
No. 2 heavy melting steel	8.00	to	8.50
Compressed sheet steel	8.00	to	8.50
Light bundled sheet stampings	6.50	to	7.00
Drop forge flashings	7.50	to	8.00
Machine shop turnings	6.25	to	6.75
Short shoveling turnings	7.00	to	7.50
No. 1 busheling	7.50	to	8.00
Steel axle turnings	7.50	to	8.00
Low phos. billet crops	13.25	to	13.75
Cast iron borings	6.50	to	7.00
Mixed borings and short turnings	6.50	to	7.00
No. 2 busheling	6.50	to	7.00
No. 1 cast	11.50	to	11.75
Railroad grate bars	7.00	to	7.50
Stove plate	6.50	to	7.00
Rails under 3 ft.	14.00	to	14.50
Rails for rolling	15.50	to	18.00
Railroad malleable	11.50	to	12.00
Cast iron carwheels	10.75	to	11.25

BUFFALO

Per gross ton, f.o.b. Buffalo consumers' plants:			
No. 1 heavy melting steel	$9.50	to	$10.50
No. 2 heavy melting scrap	8.50	to	9.00
Scrap rails	9.50	to	10.00
New hydraul. comp. sheets	8.50	to	9.00
Old hydraul. comp. sheets	7.50	to	8.00
Drop forge flashings	8.50	to	9.00
No. 1 busheling	8.50	to	9.00
Hvy. steel axle turnings	6.50	to	7.00
Machine shop turnings	4.00	to	4.50
Knuckles and couplers	11.00	to	11.50
Coil and leaf springs	11.00	to	11.50
Rolled steel wheels	11.00	to	11.50
Low phos. billet crops	11.50	to	12.00
Short shov. steel turnings	5.50	to	6.00
Short mixed borings and turnings	5.50	to	6.00
Cast iron borings	5.50	to	6.00
No. 2 busheling	5.00	to	5.50
Steel car axles	10.50	to	11.00
Iron axles	10.50	to	11.00
No. 1 machinery cast	10.50	to	11.00
No. 1 cupola cast	9.00	to	9.50
Stove plate	8.50	to	8.75
Steel rails, 3 ft. and under	12.00	to	12.50
Cast iron carwheels	10.00	to	10.50
Industrial malleable	10.00	to	10.50
Railroad malleable	10.00	to	10.50
Chemical borings	7.00	to	7.50

BOSTON

Dealers' buying prices per gross ton:			
No. 1 heavy melting steel	$5.75	to	$6.25
Scrap T rails	5.75	to	6.25
No. 2 steel	5.00	to	5.25
Breakable cast	6.00	to	6.50
Machine shop turnings	1.80	to	2.05
Bundled skeleton, long	3.80	to	4.00
Forge flashings	4.25	to	4.50
Blast furnace scrap	2.00	to	2.50
Shafting	11.00	to	11.25
Steel car axles	10.50	to	11.00
Cast iron borings, chemical	7.00	to	7.50
Stove plate	....		6.50

Per gross ton delivered consumers' yards:			
Textile cast	$7.50	to	$9.00
No. 1 machinery cast	7.50	to	9.00
Railroad malleable	11.00	to	11.50

NEW YORK

Dealers' buying prices per gross ton:			
No. 1 heavy melting steel	*$7.00		†$8.00
No. 2 heavy melting steel	*5.50	to	†6.50
Heavy breakable cast	6.50	to	7.00
No. 1 machinery cast	7.00	to	7.50
No. 2 cast	6.25	to	6.75
Stove plate	5.00	to	5.50
Steel car axles	10.75	to	11.50
No. 1 railroad wrought	7.50	to	8.00
No. 1 yard wrought, long	6.50	to	7.00
Spec. iron and steel pipe	4.50	to	5.00
Forge fire	5.50	to	6.00
Rails for rerolling	7.50	to	8.50
Short shoveling turnings	2.50	to	3.00
Machine shop turnings	2.50	to	3.00
Cast borings	3.50	to	3.75
No. 1 blast furnace	2.00	to	2.50
Cast borings (chemical)	11.00	to	11.50
Unprepared yard iron and steel	3.00	to	4.00

Per gross ton, delivered local foundries:	
No. machinery cast	$10.75
No. 1 hvy. cast (cupola size)	9.75
No. 2 cast	8.25

*For direct car loading only.
†Loading on barge.

BIRMINGHAM

Per gross ton delivered consumers' yards:			
Heavy melting steel	....		$10.00
Scrap steel rails	....		9.00
Short shoveling turnings	....		5.50
Stove plates	$7.00	to	7.50
Steel axles	10.50	to	11.00
Iron axles	10.50	to	11.00
No. 1 railroad wrought	....		7.00
Rails for rolling	....		10.50
No. 1 cast	9.00	to	9.50
Tramcar wheels	9.00	to	9.50
Cast iron borings, chem.	....		8.00

ST. LOUIS

Per gross ton delivered consumers' yards:			
Selected heavy steel	$8.75	to	$9.25
No. 1 heavy melting	8.00	to	8.50
No. 2 heavy melting	6.50	to	7.00
No. 1 locomotive tires	9.50	to	10.00
Misc. stand-sec. rails	8.75	to	9.25
Railroad springs	9.00	to	9.50
Bundled sheets	6.00	to	6.50
No. 2 railroad wrought	8.00	to	8.50
No. 1 busheling	5.00	to	5.50
Cast iron borings and shoveling turnings	3.00	to	3.50
Rails for rolling	9.75	to	10.25
Machine shop turnings	3.00	to	3.50
Heavy turnings	5.50	to	6.00
Steel car axles	10.50	to	11.00
Iron car axles	12.50	to	13.00
No. 1 railroad wrought	6.00	to	6.50
Steel rails less than 3 ft.	10.75	to	11.25
Steel angle bars	9.00	to	9.50
Cast iron carwheels	7.50	to	8.00
No. 1 machinery cast	8.50	to	9.00
Railroad malleable	8.50	to	9.00
No. 1 railroad cast	8.50	to	9.00
Stove plate	6.50	to	7.00
Agricult. malleable	8.50	to	9.00

DETROIT

Dealers' buying prices per gross ton:			
Heavy melting steel	6.75	to	7.25
Borings and short turnings	4.75	to	5.25
Long turnings	$3.75	to	$
No. 1 machinery cast	9.00	to	
Automotive cast	9.75	to	1
Hydraul. comp. sheets	6.75	to	
Stove plate	6.25	to	6
New factory busheling	5.75	to	6
Old No. 2 busheling	4.00	to	4.
Sheet clippings	3.00	to	3.5
Flashings	5.50	to	6.00
Low phos. plate scrap	7.00	to	7.50

CANADA

Dealers' buying prices per gross ton:		
	Toronto	Montreal
Heavy melting steel	$5.50	$5.50
Rails scrap	6.00	4.50
Machine shop turnings	2.50	2.50
Boiler plate	4.50	4.50
Heavy axle turnings	2.50	2.50
Cast borings	3.00	3.00
Steel borings	2.00	2.00
Wrought pipe	2.50	2.50
Steel axles	4.50	6.00
Axles wrought iron	4.50	6.50
No. 1 machinery cast	7.75	9.00
Stove plate	4.50	5.00
Standard carwheels	7.25	7.00
Malleable	6.75	7.00

ORES, FLUORSPAR, COKE, FUEL, REFRACTORIES

Lake Superior Ores

Delivered Lower Lake Ports

Per Gross Ton	
Old range, Bessemer, 51.5% iron	$4.80
Old range, non-Bessemer, 51.50% iron	4.65
Mesabi, Bessemer, 51.50% iron	4.65
Mesabi, non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.45

Foreign Ore

C.i.f. Philadelphia or Baltimore

Per Unit	
Iron, low phos., copper free, 55 to 58% iron, dry Spanish or Algerian	9.50c.
Iron, low phos., Swedish, average 68½% iron	9.50c.
Iron, basic or foundry, Swedish, average, 65% iron	9c.
Iron, basic or foundry, Russian, aver. 65% iron	9c.
Manganese, Caucasian, washed 52%	24c.
Manganese, African, Indian, 44-48%	21c.
Manganese, African, Indian, 49-51%	24c.
Manganese, Brazilian, 46 to 48½	20c.

Per Net Ton Unit	
Tungsten, Chinese, wolframite, duty paid, delivered*	$17.50 to $18.50
Tungsten, domestic scheelite, delivered†	17.00

Per Gross Ton	
Chrome, 45%, Cr_2O_3, crude, c.i.f. Atlantic Seaboard	$17.00
Chrome, 48% Cr_2O_3, c.i.f. Atlantic Seaboard	20.00

*Quotations nominal in absence of sales.
†Nominal; no supplies available.

Fluorspar

Per Net Ton	
Domestic, washed gravel, 85-5 f.o.b. Kentucky and Illinois mines for all-rail shipment	$15.50 to $16.00
Same grade for Ohio River barge shipment for Kentucky and Illinois River landings	17.50
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	$15.50 to 16.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic port, duty paid	19.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	30.00

COKE, COAL AND FUEL OIL

Coke

Per Net Ton	
Furnace, f.o.b. Connellsville Prompt	$3.85
Foundry, f.o.b. Connellsville Prompt	$4.60 to 5.10
Foundry, by-product, Chicago ovens, for delivery outside switching district	8.50
Foundry, by-product, delivered in Chicago switching district	9.25
Foundry, by-product, New England, delivered	11.00
Foundry, by-product, Newark or Jersey City, del'd	8.20 to 8.81
Foundry, by-product, Phila.	9.00
Foundry, by-product, Cleveland, delivered	$9.25
Foundry, Birmingham	6.00
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry, by-product, del'd St. Louis	9.00

Coal

Per Net Ton	
Mine run steam coal, f.o.b. W. Pa. mines	$1.80 to $2.05
Mine run coking coal f.o.b. W. Pa.	2.05 to 2.25
Gas coal, ¾-in. f.o.b. Pa. mines	2.25 to 2.55
Mine run gas coal, f.o.b. Pa. mines	2.05 to 2.45
Steam slack, f.o.b. W. Pa. mines	1.55 to 1.65
Gas slack, f.o.b. W. Pa. mines	1.90 to 2.10

Fuel Oil

Per Gal. f.o.b. Bayonne, N. J.	
No. 3 distillate	4.00c.
No. 4 industrial	3.50c.

Per Gal. f.o.b. Baltimore	
No. 3 distillate	4.00c.
No. 4 industrial	3.50c.

Per Gal. del'd Chicago	
No. 3 industrial fuel oil	3.88c.
No. 5 industrial fuel oil	3.38c.

Per Gal. f.o.b. Cleveland	
No. 3 distillate	5.50c.
No. 4 industrial	5.25c.
No. 5 industrial	4.50c.

REFRACTORIES

Fire Clay Brick

Per 1000 f.o.b. Works	High-heat Duty Brick	Intermediate Duty Brick
Pennsylvania	$45.00	$40.00
Maryland	45.00	40.00
New Jersey	55.00	43.00
Ohio	45.00	40.00
Kentucky	45.00	40.00
Missouri	45.00	40.00
Illinois	45.00	40.00
Ground fire clay, per ton	7.00	

Chrome Brick

Per Net Ton	
Standard size	$45.00

Silica Brick

Per 1000 f.o.b. Works	
Pennsylvania	$45.00
Chicago	54.00
Birmingham	55.00
Silica clay, per ton	8.00

Magnesite Brick

Per Net Ton	
Standard sizes, burned, f.o.b. Baltimore and Chester, Pa.	$65.00
Unburned, f.o.b. Baltimore	55.00
Imported grain magnesite, f.o.b. Baltimore and Chester, Pa.	45.00
Domestic grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00
Domestic, f.o.b. Chewelah, Wash.	22.00

Warehouse Prices for Steel Products

PITTSBURGH

Base per Lb.

Plates	3.15c.
Structural shapes	3.15c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.90c.
Cold-finished and screw stock—	
Rounds and hexagons	*3.45c.
Squares and flats	*3.45c.
Hoops and bands under ¼ in.	3.20c.
Hot-rolled annealed sheets (No. 24), 25 or more bundles	3.30c.
Galv. sheets (No. 24), 25 or more bundles	3.95c.
Hot-rolled sheets (No. 10)	2.95c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	$3.69
Spikes, large	2.90c.
Track bolts, all sizes, per 100 count,	65 per cent off list.
Machine bolts, 100 count,	65 per cent off list.
Carriage bolts, 100 counts,	65 per cent off list.
Nuts, all styles, 100 count,	65 per cent off list.
Large rivets, base per 100 lb.	$3.50
Wire, black, soft ann'l'd, base per 100 lb.	*2.70c.
Wire, galv. soft, base per 100 lb.	*2.925c.
Common wire nails, per keg	*2.834c.
Cement coated nails, per keg	*2.834c.

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applied to orders of 400 to 1999 lb.

*Delivered in Pittsburgh switching district.

CHICAGO

Base per Lb.

Plates and structural shapes	3.20c.
Soft steel bars	2.95c.
Cold-fin. steel bars and shafting	
Rounds and hexagons	3.50c.
Flats and squares	3.50c.
Hot-rolled strip	3.30c.
Hot-rolled annealed sheets (No. 24)	3.85c.
Galv. sheets (No. 24)	4.55c.
Hot-rolled sheets (No. 10)	3.05c.
Spikes (9/16 in. and lighter)	3.50c.
Track bolts	4.65c.
Rivets, structural (keg lots)	3.50c.
Rivets, boiler (keg lots)	3.60c.

Per Cent Off List

Machine bolts	60 and 5
Carriage bolts	60 and 5
Coach and lag screws	60 and 5
Hot-pressed nuts, sq. tap. or blank	60 and 5
Hot-pressed nuts, hex. tap or blank	60 and 5
Hex. head and cap screws	80
Cup point set screws	70 and 10
Flat head bright wood screws	37½ and 10
Spring cotters	50
Stove bolts in full packages	70 and 10
Rd. hd. tank rivets, 7/16 in. and smaller	57½
Wrought washers	$4.50 off list
No. 8 black ann'l'd wire per 100 lb.	$3.85
Com. wire nails, base per keg	3.05c.
Cement c't'd nails, base per keg	3.05c.

NEW YORK

Base per Lb.

Plates, ¼ in. and heavier	3.40c.
Structural shapes	3.37c.
Soft steel bars, small shapes	3.22c.
Iron bars	3.22c.
Iron bars, swed. charcoal	6.50 to 7.25c.
Cold-fin. shafting and screw stock;	
Rounds and hexagons	3.92c.
Flats and squares	4.42c.
Cold-roll. strip, soft and quarter hard	3.32c.
Hoops	3.52c.
Bands	3.52c.
Hot-rolled sheets (No. 10)	3.27c.
Hot-rolled ann'l'd sheets (No. 24*)	3.35c.
Galvanized sheets (No. 24*)	4.50c.
Long terne sheets (No. 24)	5.20c.
Standard tool steel	11.00c.
Wire, black annealed (No. 10)	3.25c.
Wire, galv. (No. 10)	3.85c.
Tire steel, 1 x ⅛ in. and larger	3.65c.
Open hearth spring steel	4.00c. to 10.00c.
Common wire nails, base, per keg	$3.21

Per Cent

Machine bolts, cut thread:	Off List
Up to 1 in. dia. inclusive	60
Over 1 in. dia.	50
Carriage bolts, cut thread:	
Up to ½ in. dia. inclusive	60
Over ½ in. dia.	50

Per 100 Ft.

Boiler tubes:	
Lap welded, 2-in.	$18.05
Seamless welded, 2-in.	19.24
Charcoal iron, 2-in.	24.94
Charcoal iron, 4-in.	63.65

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

ST. LOUIS

Base per Lb.

Plates and struc. shapes	3.44c.
Bars, soft steel or iron	3.19c.
Cold-fin. rounds, shafting, screw stock	3.74c.
Hot-rolled annealed sheets (No. 24)	4.09c.
Galv. sheets (No. 24)	4.79c.
Hot-rolled sheets (No. 10)	3.29c.
Black corrug. sheets (No. 24)	4.09c.
*Galv. corrug. sheets	4.79c.
Structural rivets	3.99c.
Boiler rivets	4.09c.

Per Cent Off List

Tank rivets, 7/16 in. and smaller	55
Machine and carriage bolts, lag screws, fittings up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts	
1000 lb. or over	60
200 to 999 lb.	55 and 5
100 to 199 lb.	50 and 5
Less than 100 lb.	50

*No. 26 and lighter take special prices.

PHILADELPHIA

Base per Lb.

*Plates, ¼-in. and heavier	2.95c.
*Structural shapes	2.95c.
*Soft steel bars, small shapes, iron bars (except bands)	2.90c.
‡Reinforc. steel bars, sq. twisted and deformed	2.955c.
Cold-finished steel bars	3.73c.
*Steel hoops	3.40c.
*Steel bands, No. 12 and 3/16 in., incl.	3.15c.
Spring steel	5.00c.
†Hot-rolled anneal. sheets (No. 24)	3.55c.
†Galvanized sheets (No. 24)	4.25c.
*Hot-rolled annealed sheets (No. 10)	3.05c.
Diam. pat. floor plates, ¼ in.	4.95c.
Swedish iron bars	6.25c.

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.

*Base prices subject to deduction on orders aggregating 4000 lb. or over.

†For 50 bundles or over.

‡For less than 2000 lb.

CLEVELAND

Base per Lb.

Plates and struc. shapes	3.31c.
Soft steel bars	2.95c.
Reinforc. steel bars	*2.10c.
Cold-finished steel bars	3.40c.
Flat-rolled steel under ¼ in.	3.36c.
Cold-finished strip	†3.00c.
Hot-rolled annealed sheets (No. 24)	3.96c.
Galvanized sheets (No. 24)	4.61c.
Hot-rolled sheets (No. 10)	3.11c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets	3.56c.
Black ann'l'd wire, per 100 lb.	$2.65
No. 9 galv. wire, per 100 lb.	3.00
Com. wire nails, base per keg	2.40

*Plus mill, size and quantity extras.

†Outside delivery 10c. less.

CINCINNATI

Base per Lb.

Plates and struc. shapes	3.40c.
Bars, soft steel or iron	3.15c.
New billet reinforc. bars	3.25c.
Rail steel reinforc. bars	3.25c.
Hoops and bands, 3/16 in. and lighter	3.45c.
Cold-finished bars	3.70c.
Hot-rolled annealed sheets (No. 24)	4.00c.
Galv. sheets (No. 24)	4.70c.
Hot-rolled sheets (No. 10)	3.20c.
Structural rivets	4.35c.
Small rivets	55 per cent off list
No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over)	$2.91
Com. wire nails, base per keg (1 to 24 kegs)	3.50
25 to 50 kegs	3.30
Larger quantities	3.10
Cement c't'd nails, base 100-lb. keg	3.50
Chain, 1-in., per 100 lb.	8.35

Net per 100 Ft.

Seamless steel boiler tubes, 2-in.	$19.03
4-in.	44.96
Lap-welded steel boiler tubes, 2-in.	18.10
4-in.	42.32

BUFFALO

Base per Lb.

Plates	3.37c.
Struc. shapes	3.25c.
Soft steel bars	3.00c.
Reinforcing bars	2.60c.
Cold-fin. flats and sq.	3.55c.
Round and hex.	3.55c.
Cold-rolled strip steel	3.39c.
Hot-rolled annealed sheets (No. 24)	4.05c.
Heavy hot-rolled sheets, 3/16 in., 24 to 48 in. wide	3.62c.
Galv. sheets (No. 24)	4.65c.
Bands	3.42c.
Hoops	3.42c.
Hot-rolled unannealed sheets	3.17c.
Com. wire nails, base per keg	$3.35
Black wire, base per 100 lb.	3.45c.

BOSTON

Per Lb.

Beams, channels, angles, tees, zees	3.52c.
H beams and shapes	3.52c.*
Plates—sheared, tank and univ. mill, ¼ in. thick and heavier	3.52c.*
Floor plates, diamond pattern	5.33c.
Bar and bar shapes (mild steel)	3.30c.
Bands 3/16 in. thick and No. 12 ga. incl.	3.60c to 4.60c.
Half rounds, half ovals, ovals and bevels	4.55c.
Tire steel	4.55c.
Cold-finished rounds and hexagons	5.25c.*
Cold-rolled strip steel	3.245c.
Cold-finished squares and flats	5.75c.
Blue annealed sheets, No. 10 gal.	3.60c.
One pass cold-rolled sheets No. 24 ga.	4.15c.
Galvanized steel sheets, No. 24 ga.	4.85c.
Lead coated sheets, No. 24 ga.	5.80c.

Prices delivered by truck in metropolitan Boston, subject to quantity differentials.

*Base.

PACIFIC COAST

Base per Lb.

	San Francisco	Los Angeles	Seattle
Plates, tank and U. M.	3.55c.	3.70c.	3.55c
Shapes, standard	3.55c.	3.70c.	3.55c.
Soft steel bars	3.60c.	3.70c.	3.55c.
Reinforcing bars	3.50c.	3.50c.	3.50c.
Hot-rolled annealed sheets (No. 24)	4.40c.	4.45c.	4.40c.
Hot-rolled sheets (No. 10)	3.75c.	3.80c.	3.75c
Galv. sheets (No. 24)	5.00c.	5.05c.	5.00c.
Cold finished steel Rounds	5.95c.	5.95c.	4.75c.
Squares and hexagons	7.20c.	7.20c.	6.00c.
Flats	7.70c.	7.70c.	7.00c.
Common wire nails —base per keg	$3.40	$3.25	$3.35

All items subject to differentials for quantity.

The Blanket Prescription Is Not a Cure-All

(Continued from Page 70)

3. If the number of hours were reduced to thirty, the increase in the price of the commodity would offset the rise in wages.

To the observer the weakness in Mr. Losely's arguments lies not in commission but rather in omission of certain important facts.

Granting the validity of the high rate of obsolescence, do not the savings in labor render profitable to the cost of scrapping the old machinery and installing the new? If so, what other important consideration would provoke business to install "labor-saving" devices? In truth, why call it a "labor-saving" device?

Mr. Losely goes to great lengths to demonstrate how the increase in wages would be counteracted by the increase in the price of the finished goods. It is unwarranted assumption to proceed from the premise that the fruits of modern invention can be passed to the producers and consumers alike in the same proportion. Although the increase in efficiency usually results in cheaper prices, the increase in sales at a lower profit increases the net gains for capital which further limits the position of the worker to buy back the things machines produce. It is economically fallacious to assume that capital and labor can both gain at the same time when the income of both comes out of the proceeds of the one article. Ostensibly wages in terms of dollars may appear higher, but real wages are measurably lower.

Robert Doane and Virgil Jordan, eminent economists, present a graphic picture of the percentages spent by various income groups for goods and services during the year 1929. *(Business Week*—April to September, 1932.)

The question may then be asked: "What becomes of the unconsumed income of capital?" When industry was expanding and markets could readily be obtained in foreign lands, surpluses were reinvested in larger plants, better machinery, and a general increase in plant capacity. The rate of physical growth proceeded to fall about 1910 and capital was exported across the seven seas. Foreign industrialists launched a heavy program to build up their own industries to the point where they now offer formidable competition to our own, as American tariffs indicate.

DISTRIBUTION BY INCOME GROUPS

(In Millions of Dollars)

(Business Week—April to September, 1932)

Income Group	Spent for Goods and Services	Savings
Over 1 million dollars	$87	$1,045
$50,000 to 1 million dollars	2,494	2,695
Total for Very Rich	$2,581	$3,740

(Continued on Page 79)

Increase in Heavy Industry Production in U. S. S. R.

THE gross production of the heavy industries in the U.S.S.R. from January to June inclusive of this year shows a 28 per cent gain over the similar period of 1933, according to the latest Bulletin of the U.S.S.R. Chamber of Commerce. Since the number of workers increased but 10.2 per cent, this indicates a considerable rise in production efficiency.

Production in the principle branches of industry was as follows:

	January-June, 1934	January-June, 1933
	(Thousands of Tons)	
Bituminous Coal ..	44,021	34,672
Oil (without gas) ..	11,845	9,978
Coke	6,640	4,631
Iron Ore	9,430	6,318
Iron	4,910	3,173
Steel	4,491	3,027
Rolled metal	3,090	2,271
Aluminum	5,834	1,100
Superphosphate ...	434	319

With regard to iron production while but 35.4 per cent of the 1933 production was obtained during the first six months of last year, the corresponding period of the present year represented 49 per cent of the 1934 scheduled program. Attention is called to the fact that the usual seasonal decline in heavy production was absent, for the first time, in the period under review.

Experiments in direct extraction of iron from ore are to be regularly conducted at Ivanovo commencing in September. Preliminary experiments have indicated a 95 per cent extraction at a temperature of from 900 to 950 deg. C. The per cent of acid is said not to exceed 6 per cent.

The first blast furnace in the Ukraine, at Krivoi Rog, was put into operation during July.

Effect of Pickling on Duralumin

THE influence of pickling on the fatigue-strength of duralumin was discussed by H. Sutton, head of metallurgical department, Royal Aircraft Establishment, South Farnborough, and W. J. Taylor, technical officer, Royal Aircraft Establishment, before the Institute of Metals at Birmingham, England, Sept. 5.

In order to assist in the detection of flaws, manufacturing defects, and fatigue cracks in aluminum alloy components, it has been customary to pickle or etch the components in various solutions, the main etching usually being effected in an aqueous solution of caustic soda. Wöhler-type fatigue tests were made on test-pieces machined from Duralumin bar and the effect of various pickling treatments on the fatigue-strength was investigated.

Pickling treatment A (2½ min. in 10 per cent caustic soda solution at 60 to 70 deg. C.; rinse; 1 min. in 10 per cent nitric acid, 10 per cent sulphuric acid) lowered the fatigue limit by 31 per cent, but the reduction was very much less after immersion of the test-pieces in boiling water. After a layer of 0.0025 in. thick had been machined off, the pickled test-pieces showed normal fatigue properties.

Pickling treatment B (2 min. in 10 per cent hydrofluoric acid, 10 per cent nitric acid) lowered the fatigue limit by 15 per cent.

Pickling treatment C (3 min. in 10 per cent sulphuric acid 4 parts, hydrofluoric acid 1 part; rinse; 1 min. in 50 per cent nitric acid) only lowered the fatigue limit by about 6 per cent and the reduction was less still, *i.e.*, within the limits of experimental error, when the specimens had been immersed in boiling water after being pickled. This treatment appears suitable for pickling new components to reveal macro-structure and defects, or for etching used components for the detection of fatigue cracks, stress-corrosion, cracks, etc.

C. E. JOHANSSON, creator of the widely - known precision gages that bear his name, some of which are accurate to one - millionth of an inch, is here shown inspecting a display of his gages at the Ford exhibit at the "A Century of Progress" exposition in Chicago. The Ford Motor Co. holds both North and South American rights to manufacture the Johansson gages.

Ex-Cell-O Adopts A. S. A. Bushing Standard

During the past several years a new A.S.A. (American Standards Association) bushing standard was proposed by a committee of the A.S.M.E. working in cooperation with the National Machine Tool Builders' Association, the S.A.E. and the drill jig bushing manufacturers. The proposal covers dimensions and tolerances for press fit bushings, renewable bushings and liners. The new bushings are designed to be furnished for drill sizes from 1/16 in. to and including 1¾ in. diameter, instead of 2 in. maximum diameter as previously included in the Ex-Cell-O standard bushings.

The new bushings will be furnished in nine groups or outside diameters for the head and headless press fit bushings as compared with seven groups in the previous standard. The former group number one will be divided into three groups for outside body diameters and the last or eighth group of the previous standard has been discontinued. The renewable bushings and liners will be furnished in the first seven groups as in the past.

In accordance with a decision made between the bushing manufacturers, the old standard bushings will be carried in stock for a reasonable length of time which will enable manufacturers to obtain replacements of this standard.

The new A.S.A. standard bushings are now available from stock.

Cast Iron Pipe

Austin, Tex., plans 12 and 20-in. for main water trunk line. Fund of $165,000 has been arranged for water system extensions. Hawley, Freese & Nichols, Fort Worth, Tex., are consulting engineers.

Broken Bow, Neb., plans about 12,000 ft. of 4 to 8-in. for water system. Fund of $34,000 has been secured for waterworks extensions and improvements. F. A. Raasch is water superintendent.

St. Elmo, Ill., plans water pipe line; also elevated steel tank and tower, pumping station and other waterworks equipment. Fund of $65,000 has been secured through Federal aid. Beard Engineering Co., 44 South Central Avenue, Clayton, Mo., is consulting engineer.

Skiatook, Okla., plans 8 and 12-in. pipe lines for trunk water system. Fund of $93,000 is being arranged for this and other waterworks. Victor Cochrane, Tulsa, Okla., is consulting engineer.

Williams, Ariz., will take bids soon for trunk line water system from reservoir at Dog Town Wash, and smaller pipe for distribution. Federal fund of $120,000 has been secured for waterworks extensions and improvements. Welland Engineering Co., Pueblo, Colo., is consulting engineer.

Morton, Tex., soon takes bids for 9930 ft. of 2, 6 and 8-in. for water system; also for pumping machinery and other waterworks equipment. H. N. Roberts, 2415 Twentieth Street, Lubbock, Tex., is consulting engineer.

Kenosha, Wis., opens bids Sept. 14 for pipe, steel stand-pipe, booster pumping machinery and auxiliary waterworks equipment. Alvord, Burdick & Howson, 20 North Wacker Drive, Chicago, are consulting engineers.

Quindaro Township Committee, Welborn, Kan., care of Charles A. Haskins & Co., Finance Building, Kansas City, Mo., consulting engineer, plans about 13 miles for water line, from point near Kansas City, Kan., to Welborn.

Wells, Tex., will ask bids soon for about 15,800 ft. of 2, 6 and 8-in. for water system; also for elevated steel tank and tower, and pumping equipment. Fund of $20,000 has been secured through Federal aid. Joseph Rady, Majestic Building, Fort Worth, Tex., is consulting engineer.

Hot Springs, Mont., plans water pipe line. Federal fund of $36,500 has been arranged for this and other waterworks. T. A. Taschereau, Kalispell, Mont., is consulting engineer.

Barnstable, Mass., plans about 35,600 ft. of 6 to 12-in. for water system; also 200,000-gal. capacity steel tank on steel tower. Fund of about $100,000 will be arranged. Whitman & Howard, 89 Broad Street, Boston, are consulting engineers.

Sterling, Ill., has awarded 240 tons to James B. Clow & Sons.

Marathon, Wis., has placed 200 tons with James B. Clow & Sons.

Fresno, Cal., has placed 320 tons of 6 to 10-in. with United States Pipe & Foundry Co.

Pipe Lines

Holly Refining Co., Huntington Beach, Cal., A. M. Andersen, manager, is considering crude oil steel pipe line from oil well properties to refinery on Main Street.

Commanding Officer, Aberdeen Proving Ground, Aberdeen, Md., opens bids Sept. 12 for quantity of steel pipe (Circular 23).

Fleming-Kimbell Corpn., and F. H. E. Oil Co., Fort Worth, Tex., plan joint construction of steel pipe oil gathering system in east Texas oil field district, to secure group of producing companies in that district. Project will include storage terminal facilities.

Olathe, Colo., let contract to Bruce Claybaugh, Olathe, for 9000 lin. ft. of 8-in. and 3000 lin. ft. of 6-in. steel pipe for water system.

Los Angeles Water and Power Bureau, Los Angeles, let contracts for steel pipe (Specification 1476) to Ducommun Corpn., $13,960.44; Pennsylvania Iron & Steel Co., $7930; Hacker Pipe & Supply Co., $6319, and California Pipe & Supply Co., $4633.75.

United States Engineer Office, New Orleans, closed bids Aug. 28 for seven 30-ft. lengths of 15-in. steel pontoon pipe (Circular 49).

Alhambra, Cal., let contract to American Pipe & Steel Corpn., for 3200 ft. 20-in. and 1520 ft. 16-in. electric welded steel pipe, lined inside and outside with bituminous enamel, for main water line.

Rushville, Ill., will receive bids Sept. 11 for a gas plant and distribution system. J. A. McBride Gas Engineering Corpn., St. Louis, is engineer.

Fulton, Ill., has received PWA loan and grant of $98,500 for gas plant and distributing system. Bonds have been voted. W. A. Fuller Co., St. Louis, is engineer.

WYCKOFF

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COLD DRAWN STEEL

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Whatever is most important to you in the specification of your cold drawn steels . . . whether it be exactness to size, straightness, unvarying cross-section or guaranteed machining performance, you can always depend on the Wyckoff Organization to meet your every cold drawn steel requirement.

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Turned and Polished Shafting Turned and Ground Shafting

The Salem Engineering Co., Box 254, Salem, Ohio, has been organized by Samuel Keener and M. H. Mawhinney, who were formerly associated with the Electric Furnace Co., Salem, and will engage in consulting engineering on the designing and building of fuel fired and electric industrial heating furnaces and auxiliary equipment. The company will also interest itself in the development of patents on equipment of this nature for steel mills and other clients. Engineering offices and shop facilities have been established and company is now in active operation.

Fabricated Structural Steel

Awards Decline—New Projects in Large Volume

LETTING of 9200 tons compare with 22,730 tons in the previous week and 11,400 tons two weeks ago. The only award of size is 2485 tons for a power house, navigation locks and bridge piers for the Bonneville Dam. New projects of 35,750 tons are the largest since the last week in April and include 25,000 tons for the downtown post office in New York and 5000 tons for an assembly plant at Baltimore for the Chevrolet Motor Co. New plate projects of 11,275 tons are swelled by 9900 tons for the Colorado River aqueduct, to be used for pipe if the steel alternative is accepted. Structural steel awards for the week follow:

NORTH ATLANTIC STATES

Chemung County, N. Y., 100 tons, State highway bridge, to Lackawanna Steel Construction Corpn.

Franklin County, N. Y., 100 tons, State highway bridge, to Lackawanna Steel Construction Corpn.

Monroe County, N. Y., 105 tons, State highway bridge, to McClintic-Marshall Corpn.

Philadelphia, 200 tons, building for Charles Lenning Co., to Frank Weaver.

Trenton, N. J., 150 tons, bus garage, from N. A. K. Bugbee, Inc., to McClintic-Marshall Corpn.

Pennsylvania Railroad, 150 tons, electrification material at Rahway, N. J., to Belmont Iron Works.

Burlington, N. J., 500 tons, Rancocas Creek bridge, to American Bridge Co.

Curtis Bay, Md., 200 tons, steam line supports, to Bartlett Hayward Co.

Washington, 270 tons, addition to Government power plant, to Lehigh Structural Steel Co.

SOUTH AND SOUTHWEST

Kenton and Campbell Counties, Ky., 660 tons, bridges, to F. G. Schaefer Iron Works.

Brooklyn, W. Va., 275 tons, bridge, to Pittsburgh-Des Moines Steel Co.

Jackson County, Tex., 125 tons, bridge, to Pittsburgh-Des Moines Steel Co.

Van Buren County, Ark., 400 tons, bridge, to Jones & Laughlin Steel Corpn.

CENTRAL STATES

Youngstown, Ohio, 210 tons, plant extension for Haller-Murray Co., to Fort Pitt Bridge Works Co.

Findlay, Ohio, 230 tons, bridge, to American Bridge Co.

Dayton, Ohio, 280 tons, Inland Mfg. Co. building, to R. C. Mahon Co.

Lead, S. D., 265 tons, power plant, to Worden Allen Co.

Hannibal, Mo., 1000 tons, bridge substructure, to Union Bridge & Construction Co., Kansas City.

Milwaukee Road, 560 tons, bridge at Council Bluffs, Iowa, to McClintic-Marshall Corpn.

Union Pacific, 640 tons, Tenth Street viaduct at Omaha, Neb., to McClintic-Marshall Corpn.

WESTERN STATES

Bonneville, Ore., 2485 tons, power house, navigation locks and bridge piers, to Pacific Car & Foundry Co.

Yakima County, Wash., 270 tons, State bridge over Yakima River, to Virginia Bridge & Iron Co.

Lincoln County, Wyo., 150 tons, State bridge over Ham's Fork River, to an unnamed bidder.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Waltham, Mass., 120 tons, bridge, not yet awarded.

New York, 25,000 tons, downtown post office building; bids in Oct. 2 to Treasury Department, Washington.

Pittsburgh, 500 tons, two incinerator plants; previously reported as 300 tons.

Baltimore, 5000 tons, assembly plants for Chevrolet Motor Co.; Albert Kahn, Detroit, engineer.

THE SOUTH

Dallas, Tex., 600 tons, State highway bridge.

Savannah, Ga., 2000 tons sheet piling for United States Engineers; bids opened Aug. 31.

CENTRAL STATES

Toledo, 800 tons, Y. M. C. A. building; Frank Messer & Sons, Inc., Cincinnati, general contractor.

Newcomerstown, Ohio, 468 tons, Coshocton County Bridge; Lackawanna Structural Steel Co. low bidder.

Cincinnati, 318 tons, art museum.

Chicago, 500 tons, Chicago *Tribune* radio station.

St. Louis, 1000 tons, bridge for Wabash Railway.

WESTERN STATES

Pineview Project, Utah, 675 tons, penstocks.

Pullman, Wash., 200 tons, building.

Puyton, Colo., 150 tons, bridge.

Saunders County, Mont., 225 tons, Bureau of Public Roads bridge over Thompson River; bids Sept. 12.

San Jose, Cal., 750 tons, city auditorium; bids advanced to Sept. 17.

Los Angeles, 1800 tons, aqueduct from Colorado River; bids on Specification 70 to be taken by Metropolitan Water District of Southern California on Oct. 3.

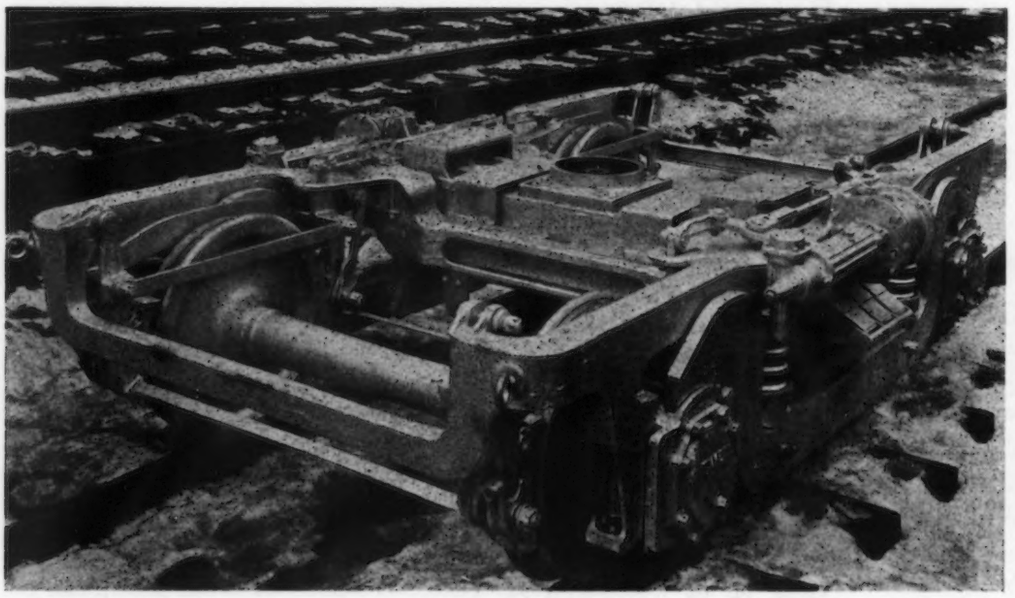
Los Angeles, 400 tons to be used for pipe in connection with Colorado River aqueduct if steel alternative is accepted; bids to be taken by Metropolitan Water District of Southern California.

FABRICATED PLATE

AWARDS

Medford, Mass., 220 tons, 42 and 48-in. welded pipe, to Farrar & Treft, Buffalo.

Crown Point, Ind., 130 tons, elevated tank, to Chicago Bridge & Iron Works.



THE trailer trucks for the stainless steel "Zephyr" train recently built for the Burlington railroad by the Edward G. Budd Mfg. Co., Philadelphia, are of the Commonwealth swing motion equalized type built with a one-piece cast steel truck frame by the General Steel Castings Corpn., Eddystone, Pa. When this photograph was used in THE IRON AGE, Aug. 9, page 12, the trucks were incorrectly described as being of welded steel plate construction. In developing this type of truck, alloy castings have been utilized in such a way that the weight has been reduced without sacrificing the advantages of integral construction.

Goshen, Ind., 250 tons, tank, to Pittsburgh-Des Moines Steel Co.

NEW PROJECTS

Denver, 650 tons penstocks and pipe for Pine View dam; bids taken Sept. 4.

Fort Peck, Mont., 725 tons, steel sealing strips for dam spillway; bids Sept. 24.

Los Angeles, 9900 tons to be used for pipe for Colorado River aqueduct if steel alternative is accepted; bids to be taken by Metropolitan Water District of Southern California.

Reinforcing Steel

Awards 1085 Tons—New Projects 76,650 Tons

Philadelphia, 350 tons, approaches for high-speed approach to Delaware River bridge, divided equally by Turner Construction Co. between Concrete Steel Co. and Kalman Steel Corpn.

State of Pennsylvania, 135 tons, road mats on route 281, to Kalman Steel Corpn.

Norfolk, Va., 200 tons, building for Navy Yard, to Kalman Steel Corpn.

Lincoln County, Wyo., 102 tons, State bridge over Ham's Fork River, to an unnamed bidder.

Oakland, Cal., 500 tons, material for East Bay Municipal Utility District; 250 tons each to Beatie Steel & Supply Co. and Herrick Iron Works.

Los Angeles, 380 tons, County bridge over Ballona Creek, to Los Angeles Iron & Steel Co.

Vale, Ore., 100 tons, canal work for Bureau of Reclamation, to an unnamed bidder.

NEW REINFORCING BAR PROJECTS

Revere, Mass., 200 tons, North Shore traffic bridge.

Taunton, Mass., 175 tons, state hospital.

Omaha, Neb., 800 tons, bridge.

Juntura, Ore., 200 tons, for Bureau of Reclamation.

State of Illinois, 1000 tons, bids opened on road work.

Chicago, tonnage not stated, alterations at Acme Steel Co.

Michigan City, Ind., tonnage being estimated, sewage disposal plant.

Fort Peck, Mont., 18,000 tons, dam spillway; bids Sept. 24.

San Francisco, 175 tons, George Washington school; bids soon.

San Jose, Cal., 300 tons, city auditorium; bids advanced to Sept. 17.

Los Angeles, 56,100 tons, Colorado River aqueduct; bids to be taken by Metropolitan Water District of Southern California.

The Blanket Prescription Is Not a Cure-All

(Continued from Page 70)

$5,000 to $50,000	$12,145	$3,236
$2,000 to $5,000	21,209	3,276
Under $2,000	53,139	2,291
Institutions	1,873	....
	$90,947	$12,543

Thus the ultra rich spend only 9 per cent as much as they save, the total of their purchases is less than 3 per cent of all consumers' goods bought by the nation. In other words, the total amount of consumers' goods cannot be bought at profitable prices by the salaries and wages of those who make and distribute consumers' goods.

A Truly Modern

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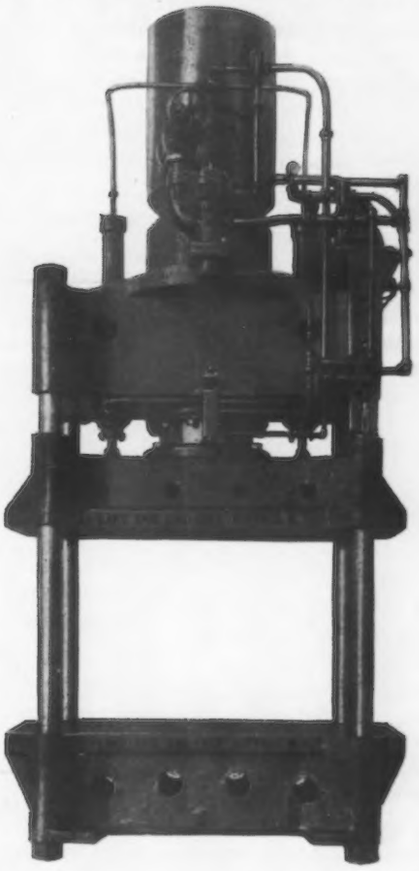


The press illustrated is giving unusual satisfaction in one of the country's largest airplane plants.

Similar presses are operating successfully in the plants of Molders of Plastic Products, and the manufacturers of Electrical Equipment, of Mechanical Refrigerators, etc.

Note the self contained motor driven unit, providing a speed of 20 strokes per minute, with highly sensitive and accurate control.

LAKE ERIE ENGINEERING CORP.

68 KENMORE STATION, BUFFALO, N. Y.

Robert Doane further estimates that wages and salaries normally constitute about 60 per cent of total national income, profits, dividends, interest, rent, and royalties, the other 40 per cent.

Later on in his article, Mr. Losely admits that "to deny the feasibility of a 30-hr. week generally does not mean that some shortening of hours may not be possible in some industries." In many cases he states two 7-hr. shifts, with a 35-hr. week, will provide a sound basis of operation for both man and machine, for the man because it will provide normal sleeping periods and ample time for recreation and development, for the machine because it will be worked fairly strenuously, to the end that it may yield a social profit before it has to be scrapped.

If the following is true, then what differentiates these machines from other machines? What qualifications do they possess that other machines do not? A close scrutiny of the article does not reveal any clarification on this point. Then is Mr. Losely in agreement with me? And if these machines "will provide a sound basis of operation," then why not a two 6-hr. shift with a 30-hr. week?

(Continued on Page 81)

Industry's Portrayal as a Black Sheep Is a Baseless Canard

(Concluded from Page 17)

a great disparity between the incomes received by capital and labor, as the New Dealers charge, but by an increasing disturbance of the normal balance which should exist among the several economic components of the nation's industrial enterprises. When some great industries remain in the depths of the depression, with continuing severe unemployment and heavy operating losses, while other industries remain relatively undisturbed by the blasting winds of the last four years, it seems futile to attempt to restore order by raising employment, wages and prices simultaneously and universally throughout the land.

Another analysis of the Department of Commerce national income data illustrates this admirably. Table X shows the changes in income produced since 1929 for each of the 12 economic divisions into which the activities of the nation are divided.

Agriculture, mining, manufacturing and construction declined more than 70 per cent from 1929 to 1932. Income produced by electric light, power and gas industries and by communication industries dropped less than 30 per cent, while governmental activities actually increased 5 per cent. That this maladjustment of our great industries, which must be in balance for orderly operation, has been a major factor in prolonging the depression seems obvious.

Table IX—Ratio of Officers' Compensation to Assets and Gross Income—1931

	All Corporations	Under $1,000,000 Assets	Over $1,000,000 Assets
Total assets	0.9%	4.2%	0.3%
Gross income	2.4	5.1	1.1

(Bureau of Internal Revenue.)

Unemployment, Not Wage Cuts, Aggravated the Depression

Surprisingly enough, this state of unbalance in productive output was not carried through in the disbursement of wages. Table XI shows the result of a study made by Dr. Leo Wolman of the changes from 1929 to 1932 in the money value and the real purchasing power of the average weekly earnings received by the workers in seven great industries.

Manufacturing, bituminous coal and metalliferous mining industries, whose productive output dropped 70 to 80 per cent from 1929 to 1932, maintained real wages for their employees at less than 30 per cent below 1929. Of greater significance is the fact that four other industrial groups—anthracite coal, public utilities, wholesale and retail trade, and railroads—maintained *higher* real wages in 1932 than they paid in 1929, although all of them, except public utilities, produced in 1932 less than half as much income as they did in 1929.

This is additional proof that unemployment, and not wage cutting, aggravated the depression and that employers, in general, were not responsible for unemployment. They are always eager to give employment when there is a profitable market for the things they produce; so it is unlikely that many of them actively tried to reduce employment.

A reasonable interpretation of this array of indisputable facts, taken from official sources, is that the chief obstacle to a quick return of prosperity is the continuing state of unbalance among the interdependent economic groups of the nation.

Table X—Changes in Income Produced—1929 to 1932

	Per Cent of 1929				* Total Decline
	1929	1930	1931	1932	From 1929
Agriculture	100.0	74.6	51.3	29.6	70.4
Communications	100.0	97.1	88.5	73.2	26.8
Construction	100.0	85.6	54.0	14.7	85.3
Elec. light, power, gas	100.0	95.0	91.4	74.3	25.7
Finance	100.0	89.8	68.6	47.9	52.1
Government	100.0	104.8	105.2	105.3	*5.2
Manufacturing	100.0	73.8	50.0	30.3	69.7
Mining	100.0	70.1	39.0	28.1	71.9
Service	100.0	92.6	77.1	56.9	43.1
Trade	100.0	83.5	64.9	47.6	52.4
Transportation	100.0	86.6	69.4	51.0	49.0
Miscellaneous	100.0	91.7	75.0	56.6	43.4
Total	100.0	84.7	65.8	47.4	52.6

*Increase.
(Department of Commerce.)

Table XI—Average Weekly Earnings—1929 and 1932

Industry	1929	1932	Per Cent Change Money	"Real" Earnings
Manufacturing	$24.36	$18.18	—33.6	—14.9
Bituminous coal	25.00	13.78	—44.9	—29.4
Anthracite coal	30.85	24.86	—19.6	+3.1
Metal mining	30.12	18.63	—38.2	—20.8
Public utilities	29.56	28.58	—3.3	+24.0
Trade	25.10	21.95	—12.6	+12.1
Class I railroads	32.62	27.15	—16.8	+6.7

(Department of Commerce; Bureau of Labor Statistics.)

India Recommends Steel Duties Revision

THE report of the Indian select committee on the steel bill, which has just been published, recommends the following important changes:

1. That structural steel and iron and steel plates of British manufacture be subject to a 10 per cent ad valorem duty.

2. That in view of the possible importation of highly priced alloy steel bars, there be an alternative to the specific duty of a normal 20 per cent ad valorem revenue duty.

3. That the countervailing duty levied on tinplates and tinned sheets be increased from 1 1/3 to 1½ times the excise duty on steel ingots, in view of the wastage of steel incurred in manufacture.

It is very probable that these recommendations will be adopted by the Indian Government.

The Allsteel Press Co., 12015 S. Peoria Street, Chicago, manufacturers of the Verson Allsteel line of punch presses and sheet metal working machinery, has appointed L. Ray Phipps, 918 Lapeer Street, Flint, Mich., exclusive representative in the Flint, Lansing, Saginaw and Bay City territory of Michigan.

(Concluded from Page 79)

The crux of our differences lies in the very trenchant statement, "The burden of interest in industry is really the smallest part of the load." If that is the case, then I again call Mr. Doane to the stand to testify (Robert R. Doane: The Measurement of American Wealth) concerning capital claims upon industry. The total of capital claims, including long and short-term debts, plus common and preferred stock on which dividends are expected, was in 1929 close to 300 billions of dollars. Moody's Manual recently listed $1,200,000,000 of American bonds, dated to mature after 2000 A. D.—a guarantee that this sum will be paid to heirs not yet born.

At the same time the claims of capital were increasing, the physical rate of growth (not total volume) has been declining since 1910. In earlier depressions this disparity between debts and curves of growth was offset by wholesale bankruptcies, repudiations, and tremendous write-downs. As Basset Jones has shown, these were sufficient to bring the debt curve into alinement with physical production, allowing both to move forward with a new wave of expansion.

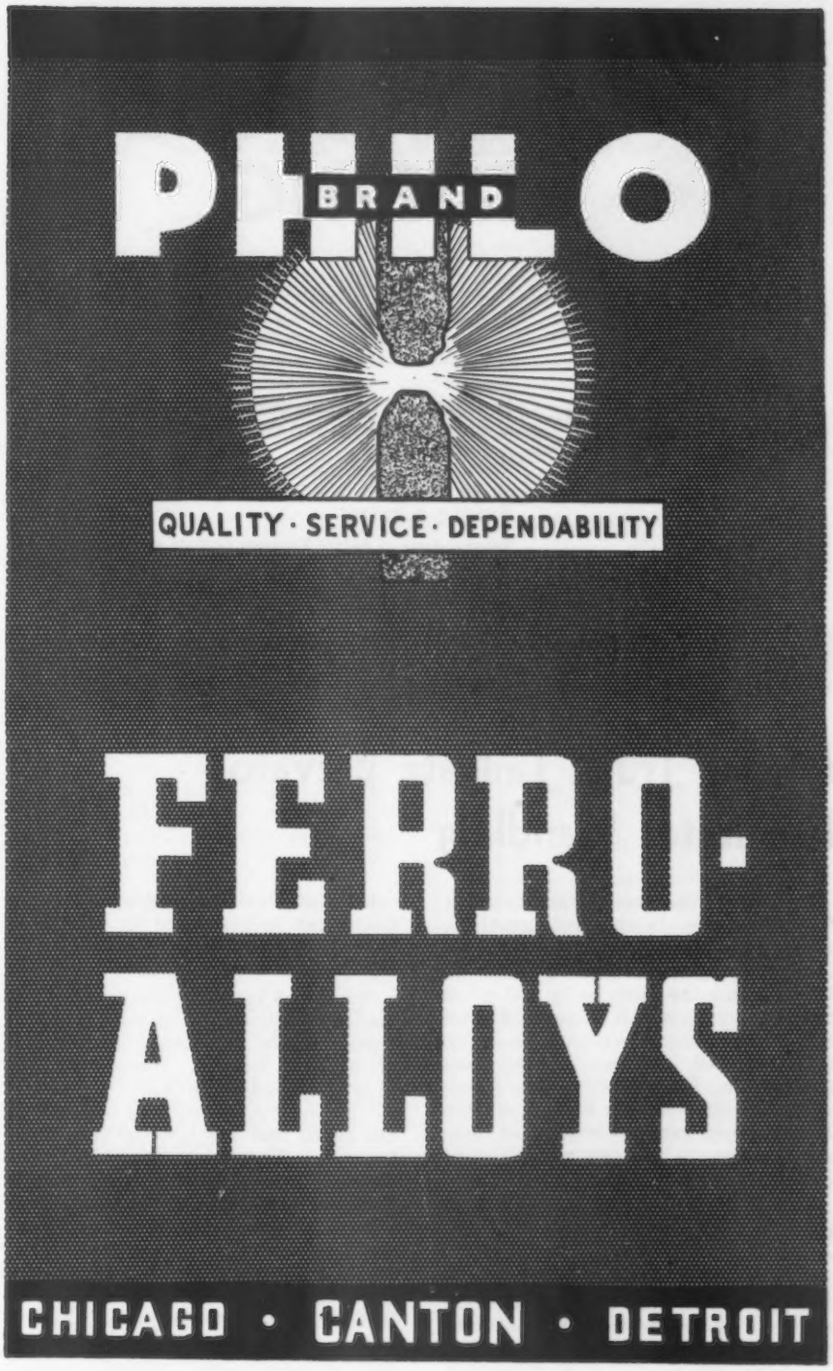
Another obvious method is to scale down all debts by inflation, devaluation of the dollar, or otherwise, and start all over again. Inflation, however, breeds further inflation. Italy and Germany have tried putting their creditors through this process with the result that an infuriated middle class was stripped of their savings, and precipitated fascism.

Although it is imperative that industry adopt a 30-hr. week to take up the slack produced by the displacement of labor by machines, this alone will not salvage the many industries crippled and rendered paralyzed by the depression. The proposal of a compulsory 30-hr. week, however meritorious, will not sufficiently bring back into the workshops of the world the vast amount of unemployed.

Nevertheless, according to the most recent reports there are ten million unemployed. The continued existence of such a large group of idle hands, of impoverished consumers, must only result in a prolonged breakdown unless drastic immediate action is taken to put them back into the producing and consuming class.

There is no occasion in a civilized country why crops should be destroyed when children go hungry, why clothing factories remain idle when good clothing is so badly needed, why millions should live in tenements and outmoded homes when hundreds of thousands of skilled mechanics walk the streets. These are realistic problems that must be approached by realistic thinking. The compulsory reduction of hours remains as only one step in this movement toward national recovery. Let's boost it as much as we can!

John Schulter



Radio Manufacturers Busy on 1935 Models

RADIO makers in the East, as well as the Middle West, are swinging into production on their 1935 models. The market has been very quiet during the summer, but improvements on current receiving sets are calculated to stimulate demand in the fall and winter. Steel tonnage required is not large, but special grades are needed in most cases. As a result, the radio industry is expected to play an important part in fall recovery for the steel industry. Sheets and strip steel are the principal products required in radio manufacture, although a fair tonnage of bars and wire is needed. Progress in television is expected to provide an important new outlet for steel in the future, but commercial production of television receiving sets is not immediately likely.

NON-SHRINK, OIL HARDENING

TOOL STEEL TUBING

The job of making ring dies, cutting dies, bushings spacers, etc., is half done when you start with Bissett Tool Steel Tubing. There is a size carried in stock to meet every requirement up to 12" O.D. and 2" wall thickness. Larger sizes can be supplied.

It eliminates forging, does away with annealing difficulties and cuts down machining cost.

We also supply special tubing to S.A.E. 52100 and S.A.E. 4615 analysis for Ball Bearing purposes.

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Motor Truck Tailgate Elevator Facilitates Handling

A DEVICE designed to handle radiators, boilers, refrigerators, ranges and other merchandise, also large castings, barrels and boxes of fittings and the like, in or out of a truck or van, without manual labor on the part of the attendants, is being manufactured by the Davey Compressor Co., Inc., Kent, Ohio. Operation of this device, known as the Davey-Troell power elevator or tailgate, shown in the accompanying illustrations.

Mounted on a welded steel frame, the device forms part of the rear end of the truck body. The elevating tailgate is driven by a worm gear from a power take-off on the truck drive shaft. Two drums near the center of the truck chassis operate cables leading to rams mounted in vertical sliding grooves. The drums are controlled by a shaft from the worm gear, and the entire cycle of raising and lowering is under the operator's control at all times. Rate of vertical travel can be regulated by increasing or decreasing the speed of the truck motor.

When the truck is transporting its load the tailgate, of standard dimensions, serves the usual purpose of holding the load in. When the truck is to be unloaded the tailgate is swung out horizontally flush with the floor of the truck and the load is moved out upon it. The worm gear acts as a positive brake, holding the tailgate flush with the floor of the truck when loading or unloading, or at any other desired point, without sagging. It is stated that loads may be lowered or elevated to or from the street level in 60 sec.

The device can be applied to old as well as new trucks. Advantages emphasized include eliminating of breakage of merchandise and protection of workmen from injuries caused by heavy lifting and straining.

German Iron and Steel Scrap Imports

ALTHOUGH German imports of iron and steel scrap declined in May and June as compared with preceding months, scrap imports continue on a higher level than usual, according to a report from Vice-Consul J. H. Wright, Cologne, made public by the Commerce Department.

The German demand for scrap, it is pointed out, has slackened somewhat lately in the face of increasing iron and steel production. Producers are using more ore than has been customary during recent months. Domestic stocks of scrap are not at all large, but a shortage can not be stated to exist.

It is likely, the report states, that scrap imports will continue to decrease in view of the lack of foreign exchange available to make payments for scrap imports. It is believed that any available foreign exchange will be devoted to ore importations, which are more important, rather than to scrap importation.

Total German imports of scrap during the first six months of 1934 amounted to 270,898 metric tons, valued at 9,060,000 reichsmarks, as compared with 228,850 metric tons, valued at 6,481,000 reichsmarks, during the corresponding period of 1933. The chief suppliers of scrap to the German market are the Netherlands and Belgium.

Railroad Equipment

Cambria & Indiana is asking bids on changing 1000 cars from arch bar trucks to cast steel side frames.

Illinois Central plans to recondition 162 all-steel passenger cars. About 100 cars will be repaired and the remainder will be rebuilt.

Missouri Southern has ordered a double-unit Diesel electric locomotive from Plymouth Locomotive Works division of the Fate-Root-Heath Co.

Harmer Steel Products & Supply Co., Portland, Ore., has been awarded contract for about five carloads of 90-lb. tie plates and switches for track relocation of Spokane, Portland & Seattle Railway Co. at Bonneville Dam, Ore.

RAILS

Richmond, Fredricksburg & Potomac has ordered 1150 tons of 131-lb. rails from Bethlehem Steel Co.

Stockton, Cal., has awarded 124 tons of girder rails for wharf work to Pacific Coast Steel Corpn.

WIBMAN & WARD CO., Oliver Building, Pittsburgh, has been appointed sales agent for Puritan Coke Co., McClellantown, Pa., and Atlantic Crushed Coke Co., Bradenville, Pa. The primary business will be in domestic sizes, for which both producing companies are installing new crushers and screens.

New Equipment and Processes Are Developed By British Steel Makers

LONDON, ENGLAND, Aug. 28 (*By Special Correspondence*). — The improved outlook that has prevailed recently in the British iron and steel trade has resulted in the erection of new plant and machinery at various works and in certain new processes having now reached the stage of commercial production.

Of new equipment the sintering plant at the Appleby Ironworks, near Scunthorpe, is a noteworthy example, and of the new processes the high-frequency electric plant for high tensile steels at the Stocksbridge works, near Sheffield, stands out as a remarkable recent achievement.

New Sintering Plant

At the Appleby Ironworks the new sintering plant is based on the Greenawalt process. When in full operation it will have a weekly output of 5500 tons. It is of the most modern construction, embodying new features of design that place it in the forefront of such sintering plants in British steelworks. Local ironstone is of fairly low iron content—about 23 per cent. It is usually mixed for blast furnace use with Northamptonshire ironstone, which has an iron content of about 33 per cent. The sintering plant makes the use of the fine material of the Frodingham ironstone an economic proposition where formerly it was practically waste material and a source of inconvenience in clogging up furnaces. The sinter now produced at the Appleby works has an iron content of about 38 per cent.

The Redbourne Hill works, Scunthorpe, lately reopened and is now working on the production of steel that would otherwise have been imported. Here the work is chiefly rerolling and is carried out on an extensive scale with new equipment. It is with regard to rerolling that the chief difficulty of the efficient organization of the British iron and steel industry as a whole arises. Rerolling is carried out by many small concerns working on a low scale of production which would be uneconomic for any of the large undertakings. But many of them are working with plant and machinery which is admittedly obsolescent. Such works can still operate at a small margin of profit, which has been much enhanced by the purchase of cheap Continental steel for rerolling. It follows that an efficient and highly organized undertaking specializing in rerolling work may have enjoyed good profits by rerolling cheap imported steel.

Working Agreements Popular

A working agreement between two concerns such as has been entered into at Redbourne Hill, by which the entire output of one firm's furnaces is taken for rerolling by a second firm, is thus of great benefit to the British industry, being at once a salutary result of the duties on foreign steel and a significant step toward reorganization in the industry.

High-tensile steels are a type of production in which Sheffield has made notable progress. Such steels for special constructional purposes have met with considerable success. As a result of recent researches the United Steel Companies combine has decided that one quality of high-tensile constructional steel does not meet the varied demands of the several branches of the constructional trade, and has now extended its range to four steels which cover the entire field.

Notable advances have also been made in the use of high-frequency electric plants for exceptionally high-class steels. A plant of this kind costing over $500,000 has been installed at the Stocksbridge works, near Sheffield, and produces high-grade steels in large tonnages. The high-frequency melting plant resembles a clean and orderly laboratory. The furnaces are steel boxes and are quite cool externally. The analysis and temperature are under precise control, and there is a greater conservation of alloying elements than is possible with any other steel-making process.

Research Gets Attention

Research is also receiving greater attention in the steel industry, a typical example of recent organization being provided by the newly established central research department of the United Steel Companies combine. The headquarters of the combine in Sheffield acts as a coordinating center for the over-all operation and policy of the group and to it are attached various services common to the group as a whole, such as statistics, fuel efficiency and mechanical efficiency. The central research department is the most recent addition to these services, and functions in relation to the works laboratories of each producing unit. A continuous contact with production is maintainind by the works research laboratories to investigate wastage and study processes with the production staff, so as to improve the technique of manufacture and manipulation.

The Eagle-Picher Sales Co. has been organized as a wholly-owned subsidiary of the Eagle-Picher Lead Co., Cincinnati, and will take over the sales and distribution of all products manufactured by the parent company. It will have the same sales personnel as that formerly maintained by the Eagle-Picher company, with A. E. Bendalari as president; Frederick Hertenstein, F. W. Potts, W. E. Maston, John R. MacGregor and R. M. Roosevelt as vice-presidents; Joseph Hummel, Jr., as secretary and treasurer, and C. A. Geist as assistant treasurer.

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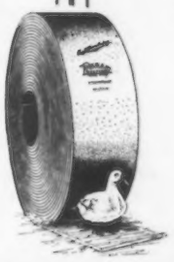

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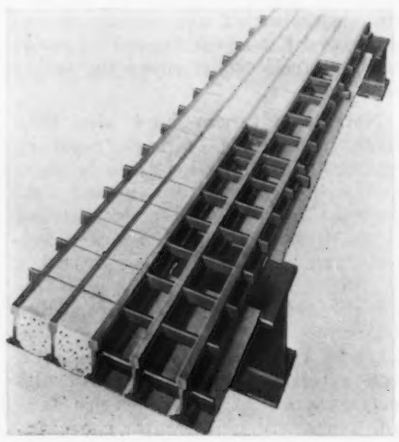
Carnegie Steel Co. Develops Armored Floor Construction

RESEARCH has uncovered another application for steel. The Carnegie Steel Co., Pittsburgh, recognizing the need for a lighter, more rugged, less costly, and practicable combination steel and concrete bridge roadway slab or heavy duty floor, has developed the I-Beam-Lock armored construction, which applies to advantage the well-known principle of the strength of the I-beam. The light weight of the new product permits its application to small beam and girder bridges, and also to heavy duty factory floors, garages, ramps, wharves, docks and similar structures.

The construction is a series of alternating I-beams and concrete ribs thoroughly tied and locked together by an adequate number of notched cross bars near both the top and bottom surfaces. The top bars form a part of the integrally armored surface, as illustrated. Metal form strips, closely fitted between the lower flanges of the I-beams, provide a tight form work for the concrete. These strips are omitted over the top flanges of supporting beams or girders, permitting the concrete to come directly in contact with the bearing areas. The gap in the form strips over the supports and the open space between the I-beams facilitate the welding of the I-beams to stringer flanges. Only the webs of the I-beams are punched or pierced for the insertion of the cross bars. Both top and bottom flanges of the I-beams are intact throughout their entire length.

The slab is so designed as to have constant moment of inertia for resisting both positive and negative bending moment stresses. The notched cross bars are first inserted flat in the L-shaped web holes, then turned through an arc of 90 deg., and tack welded in their final position. These bars hold and lock the I's rigidly at uniformly spaced intervals.

At present, I-Beam-Lock armored units are available in 3-in. depths and 3½-in. depths. In the 3-in. depth, this construction is said to require only 15.5 lb. of steel per sq. ft., and, in the 3½-in. depth, only 16.4 lb. The high ratio of strength to weight of steel is claimed to be due to the efficient utilization of steel in the design. The shape of the I-beams produces a



construction that has a constant moment of inertia for resisting reversals in stress such as occur from positive and negative bending moment in continuous slabs.

In addition to its suitability for use on steel framed structures, it may also be used to form the floor system of a reinforced concrete bridge, as the I-Beam-Lock armored slab will function as the flanges of a T-beam. Initial application of I-Beam-Lock bridge roadway slabs will be made soon after Labor Day in repairs to two approaches to a bridge on Grand Boulevard, Detroit, for which about 200 tons will be used.

The Carnegie Steel Co. has prepared a 24-page booklet, describing and illustrating the new product. Design data, design formulas, load tables and other information are comprehensively presented.

Distillation Equipment Built of Arc Welded Aluminum

(Concluded from Page 23)

at 75 lb. pressure. Supports for the condensers were also welded of heavy plate, as shown in Fig. 2.

Eight-inch piping connects the condensers and the still. This piping was fabricated completely by arc welding from aluminum sheets. More than $50 was saved on this piping alone over the cost of cast fittings.

The two rectangular and two cylindrical receiving tanks below the condensers were also arc welded in their entirety, including the fittings. All welding was done by the shielded arc process, using Aluminweld electrodes and arc welding generators manufactured by the Lincoln Electric Co., Cleveland. The electrode used was selected on the basis of maximum penetration, density and ease of handling. Sheets used were 3S aluminum throughout.

Many unusual problems arose, since this distillation plant is the first of its kind to be built and there were no precedents to follow. Arc welded construction was decided upon due to its simplicity, speed and efficient distribution of mtal. According to the manufacturer, any other method of construction would necessitate the use of exceedingly expensive castings, which would also increase the weight of the equipment and would require much longer time to complete.

The American Gear Manufacturers Association will hold its semi-annual meeting at the New Pfister Hotel, Milwaukee, Oct. 22 and 23. J. C. McQuiston, Penn-Lincoln Hotel, Wilkinsburg, Pa., is manager-secretary.

Granddaddy of Electric Cranes Still in Service

IT is something, in this age of efficiency when equipment becomes so quickly antiquated and is replaced by the new, to find a unit that has been steadily on the job and delivering satisfactory service for almost 50 years. An automobile of only half that age would provoke a laugh on any self-respecting boulevard.

But 44 years ago, when the Union Pacific System was building new shops at Cheyenne, Wyo., the company was looking for the last word in equipment. Up to this time, cranes had been operated through a combination of manual and electric drive. Union Pacific executives heard that several young men in Milwaukee were experimenting with three-motored electric cranes. It was something new—revolutionary in design. But they placed an order. The noteworthy thing is that this was the first tri-motored electric crane ever completely designed and built by the Harnischfeger Corpn., in whose shops this particular type of equipment was developed. But more surprising is the fact that this old granddaddy of electric cranes is still doing active duty today.

The old-time photograph, taken in 1890, shows the 40-ton unit when it was first installed. Forty-four years and the old patriarch is still going strong! The only changes are control mechanism and hoist motors which have been modernized.

This year, the Harnischfeger Corpn. is celebrating its 50th birthday. In going over the records of early equipment, the company discovered that this original P. & H. tri-motored crane was still in service.

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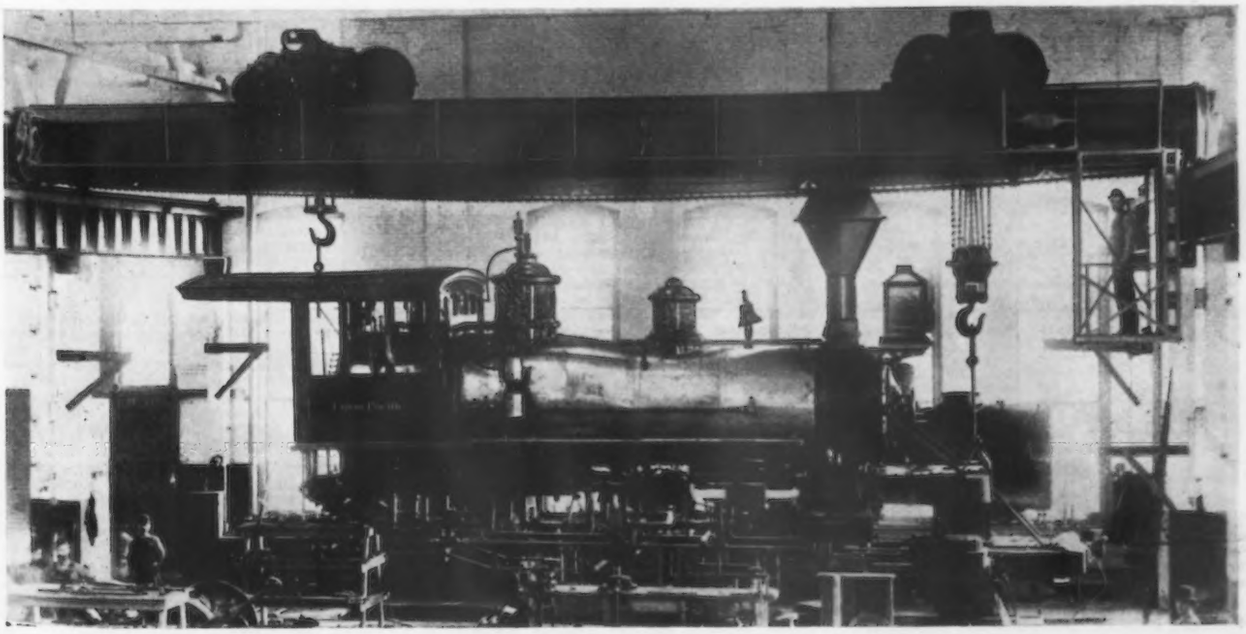
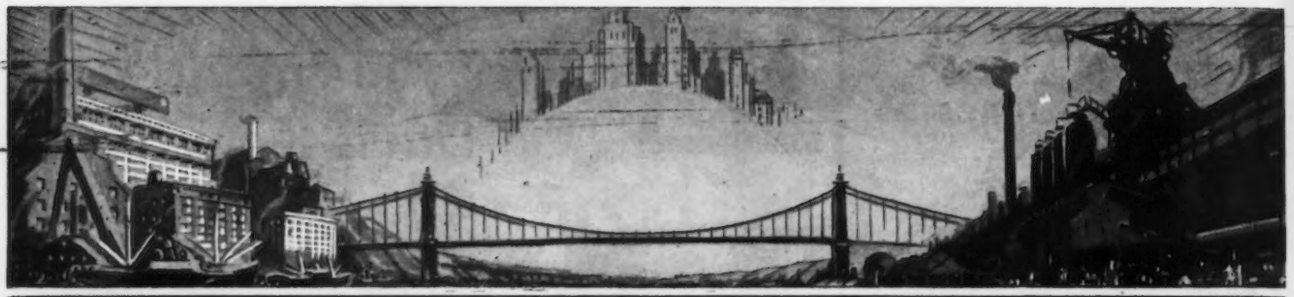
Steel Companies Reduce Salaries

THE United States Steel Corpn. has announced that, effective Sept. 1, all of its salaried employees were placed on a five-day week, with a decrease of approximately 10 per cent in remuneration. As mentioned in THE IRON AGE last week, similar action had already been taken by the Republic Steel Corpn., and a number of the other large steel companies have since followed suit. Wage rates in the mills were not disturbed and continue at slightly above 1929 levels.

The Steel Corporation's announcement of the move follows:

> In view of the present basis of operations, Saturday work is irregular and unsatisfactory. The United States Steel Corpn. has therefore recommended to its subsidiaries that, effective Sept. 1, and at least until marked improvement in operations takes place, Saturday work for its salaried employees be eliminated, and salaries adjusted accordingly. This will involve a decrease of practically 10 per cent to all salaried classes affected.





PLANT EXPANSION AND EQUIPMENT BUYING

Large Army Inquiry Expected—Packard Places $300,000 Order for Tools

AS mentioned briefly in THE IRON AGE last week, the PWA has allotted $2,300,000 to the Army Ordnance Department to be used for the purchase of machine tools for arsenals in various parts of the country. Details of this business are expected in the near future as soon as inquiries can be prepared.

Outstanding orders in the past week came from the Packard Motor Co. which placed equipment for its cylinder block and crankcase assembly on a new model amounting to approximately $300,000. Additional buying by this company is expected this week. Several other automotive companies have also placed orders for tools recently and a number of new inquiries are in prospect. Substantial buying by the automobile industry, however, is still being postponed.

The August business of a number of machine tool makers turned out better than had been anticipated and compared favorably with July orders in some cases. A number of inquiries for single tools are before the trade but large lists are still lacking. The State forestry laboratory at Madison, Wis., is purchasing several tools.

NORTH ATLANTIC

Standard Oil Co. of New York, Inc., 26 Broadway, New York, has approved plans for new bulk oil storage and distribution plant at Elmira, N. Y. Cost about $60,000 with tanks and other equipment.

Anton Busch Co., 11 West Forty-second Street, New York, wines and liquors, is acquiring site for new winery near Pen Yan, N. Y. Cost over $100,000 with equipment. Company is arranging for preferred stock issue to total about $170,000, part of fund to be used for purpose noted.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Sept. 11 for main circulating pumps, main feed pumps and main condensate pumps, with spare parts and tools (Schedule 3116) for Brooklyn and Philadelphia navy yards; until Sept. 14, 68 sets of drawing instruments (Schedule 3213) for Brooklyn, Sewall's Point and Mare Island yards; until Sept. 18, 153 pairs of hand irons (Schedule 3234) for three last noted yards.

American Brakeblok Corpn., 230 Park Avenue, New York, manufacturer of railroad car equipment, subsidiary of American Brake Shoe & Foundry Co., plans two-story addition to plant at 4660 Merritt Avenue, Detroit. Cost close to $45,000 with equipment.

Signal Supply Officer, Army Base, Brooklyn, asks bids until Sept. 21 for 24,000 ft. cable and seven reels (Circular 15), 60 clocks (Circular 13), 37 test sets (Circular 14).

Board of Transportation, 250 Hudson Street, New York, has let general contract to William Kennedy Construction Co., 215 Montague Street, Brooklyn, for new car inspection shed, service and shop building at Jamaica, L. I., for independent subway system, at price of $533,355.22, exclusive of equipment.

Department of Public Utilities, Rockville Center, L. I., has plans for addition to municipal electric light and power plant. Federal fund of $260,000 has been arranged for building and equipment. H. C. Major is engineer in charge.

Department of Hospitals, City of New York, Municipal Building, has plans for extensions and improvements in power plant at Bellevue Hospital, foot of East Twenty-sixth Street, including new equipment. Cost over $500,000 with machinery. Fund of $3,830,000 has been secured for expansion at institution. McKim, Mead & White, 101 Park Avenue, are architects.

United States Engineer Office, First District, New York, asks bids until Sept. 10 for 2000 lb. ⅞-in. drill steel (Circular 53).

Grasselli Chemical Co., Grasselli, Linden, N. J., is considering additions to plant and improvements in present units. Cost over $250,000 with equipment. Headquarters are at 350 Fifth Avenue, New York.

Board of Education, Bayonne, N. J., plans manual training department in new multi-story high school. Fund of $1,200,000 has been secured through Federal aid for building and equipment.

Frankford Grocery Co., Inc., Penn and Unity Streets, Frankford, Philadelphia, has let general contract to Barclay White Co., 22 North Thirty-sixth Street, for five-story storage and distributing plant. Cost about $200,000 with equipment. William M. Stanton, Philadelphia, is architect.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Sept. 14 for 105 engine-driven fuel pumps (Schedule 3216), 300 aircraft pitot-static tubes (Schedule 3211) for Philadelphia Navy Yard; until Sept. 18, quantity of admiralty metal condenser tubes (Schedule 3233) for Philadelphia and Norfolk, Va., yards.

Lackawanna Beer & Ale Corpn., Scranton, Pa., is arranging for sale of stock totaling $120,000, part of fund to be used for purchase of rolling stock and equipment, materials, etc. Fred J. Huester is president.

NEW ENGLAND

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Sept. 11 for four motor-driven radial drills (Schedule 3228) and eight motor-driven grinders (Schedule 3229) for Newport, R. I., navy yard.

State Department of Mental Diseases, State House, Boston, has let general contract to J. Hamre & Son, 55 Buckingham Road, Quincy, Mass., for new one-story shop building, 67 x 140 ft., at state hospital at Westboro, Mass. Monks & Johnson, 99 Chauncy Street, Boston, are architects.

Revere Copper & Brass, Inc., New Bedford, Mass., has let general contract to J. W. Bishop Co., 182 Sycamore Street, for one-story foundry addition, 167 x 190 ft.

American & Republican, Inc., Waterbury, Conn., has acquired property between Prospect and New Haven, Conn., for new radio broadcasting station, to include two steel towers about 189 ft. high, antenna installation, power station and other structures. Cost over $60,000 with equipment.

Economy Oil Co., South Port, Me., care of Addison G. Pulsifer, 163 Main Street, Lewiston, Me., architect, has revised plans for new bulk oil storage and distribution plant. Cost about $40,000 with tanks and equipment.

BUFFALO DISTRICT

Potter Refrigerator Corpn., Jackson Building, Buffalo, T. Irving Potter, president, has acquired plant and property of Jewett Refrigerator Co., 2 Letchworth Street, for new assembling plant for electric refrigerator units, transferring such operations from Detroit. Cabinet manufacture will be continued at Connersville, Ind., as heretofore. Potter company will take over certain other assets of Jewett company. Under another name, Jewett company will retain and operate a plant at Lackawanna, N. Y., for production of new line of electric refrigeration equipment for hotels and large buildings.

New York State Electric & Gas Corpn., Ithaca, N. Y., plans new substation and transmission lines at Ovid, N. Y., and vicinity. Cost over $50,000 with equipment. Similar program will be carried out at Somers, N. Y., to cost close to like sum.

Angola School District, Angola, N. Y., plans manual training department in new central high school. Fund of $176,000 has been arranged. Bley & Lyman, 505 Delaware Avenue, Buffalo, are architects.

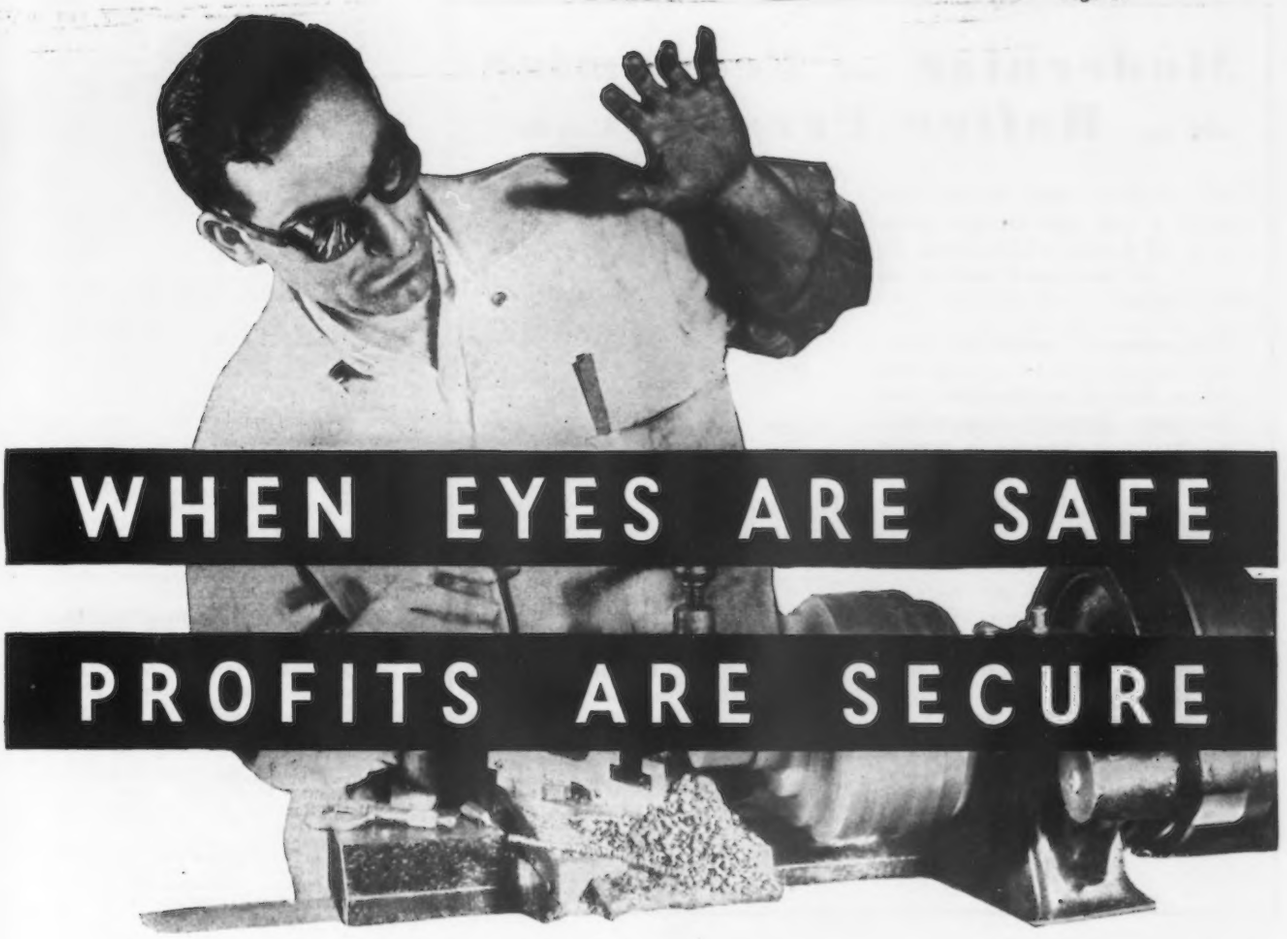
OHIO AND INDIANA

Clifton Distilling Co., 2500 West Twenty-fifth Street, Cleveland, recently organized, has let general contract to Lees Construction Co., 2812 Mayfield Road, for remodeling building at location noted for new distillery. Cost about $50,000 with equipment. John W. Little and Wallace W. Leipner, both Plymouth Building, are architect and consulting engineer respectively. W. B. Israel is general manager.

Holland-Reiger, Inc., 2006 Wyandotte Street, Kansas City, Mo., formerly known as Vulcan Mfg. Co., manufacturer of electric washing machines, parts, etc., is removing plant to Sandusky, Ohio, where former factory of Erie Tire Co., on 10-acre tract, was recently acquired. Present three-story unit will be improved and one-story addition built for enameling department.

Material Division, Air Corps, Wrights Field, Dayton, Ohio, asks bids until Sept. 10 for 16,000 cowling fasteners, 15,000 cowling fastener grommets, and 4700 cowling fastener springs (Circular 68); 180 tube assemblies, pitot static (Circular 71).

Kroger Grocery & Baking Co., 35 East Seventh Street, Cincinnati, has secured low bid on general contract from Penker Construction Co., 1030 Summer Street, for two-story and basement meat-packing and proc-



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100 Main Street, Ansonia, Conn.

essing plant, 150 x 200 ft. Cost close to $500,000 with equipment. Tietig & Lee, 34 West Sixth Street, are architects.

Roto-Cam Mfg. Co., Cambridge, Ohio, manufacturer of piston rings and kindred equipment, is removing plant and business to New Philadelphia, Ohio, where production will be concentrated and expanded.

W. R. Miller & Associates, Inc., 151 West Third Street, Mansfield, Ohio, is considering new one-story plant for manufacture of steel barrels, to be lined with glass. Cost about $35,000 with equipment.

Richard Lieber Brewing Co., 1254 South West Street, Indianapolis, has work under way on extensions and improvements in brewery and plans early installation of brewhouse machinery, air compressors, pumps, etc. Cost over $75,000 with equipment. Vonnegut-Bohn & Mueller, Indiana Trust Building, are architects.

Board of Trustees, Indiana State School for Boys, Plainfield, Ind., is planning new one-story industrial building at institution. Cost about $172,000 with equipment.

SOUTH ATLANTIC

Turpentine & Rosin Factors, Inc., Jacksonville, Fla., plans new one-story plant, 30 x 85 ft., at Valdosta, Ga., with 250,000-gal. steel tank, pumping and other equipment.

City Council, Charlotte, N. C., plans installation of pumping machinery, pipe lines, etc., for extensions and improvements in municipal waterworks. Fund of $27,000 has been authorized.

State Prison Department, State House, Atlanta, Ga., will soon take bids on general contract for new buildings for Georgia State Prison Farm, near Reidsville, Ga., including power plant, machine and industrial shops, and manufacturing divisions, water plant and system, baking plant, mechanical laundry, cold storage and refrigerating plant, and other units. Cost about $900,000. Tucker & Howell, Rhodes-Haverty Building, Atlanta, are architects; Newcomb & Boyd, Walton Building, Atlanta, are mechanical and electrical engineers.

City Council, Sandersville, Ga., plans extensions and improvements in municipal electric light and power plant and city waterworks, including new equipment. Fund of $116,000 is being arranged.

SOUTHWEST

Porterfield Aircraft Corpn., 1328 Locust Street, Kansas City, Mo., recently organized by E. E. Porterfield, Jr., and associates, to manufacture airplanes and parts, has leased local property and will install equipment at once. Later larger space will be acquired and plant expanded.

Crescent Brewing Co., Marionville, Mo., has approved plans for new mechanical bottling works, storage and distributing building. Cost over $50,000 with equipment. Carl R. Meyers is general manager.

United States Engineer Office, Missouri River Division, Postal Telegraph Building, Kansas City, Mo., asks bids until Sept. 11 for 30 portable electric air heaters for Fort Peck dredges (Circular 95).

City Council, Hoisington, Kan., is considering new municipal electric light and power plant. Cost about $150,000 with equipment. W. B. Rollins & Co., Railway Exchange Building, Kansas City, Mo., are consulting engineers.

Sterling Lighting Co., 118 Delmar Avenue, St. Louis, lighting fixtures and equipment, has asked bids on general contract for new one and one-half story plant. Cost about $30,000. John D. Paulus, 4729 Northland Avenue, is architect.

San Antonio Brewing Association, 261 East Rosewood Avenue, San Antonio, Tex., B. B. McGimsey, general manager, plans extensions and improvements in five-story brewery on James Street, including new equipment. Several 200-bbl. capacity steel tanks will be installed. Cost over $60,000 with equipment.

Chappelle Engineering Co., Gladewater, Tex., has approved plans for new gasoline refining and treating plant, with main structure, 40 x 120 ft. Cost about $30,000 with tanks, retorts and other equipment.

City Council, Big Sandy, Tex., plans installation of pumping machinery and auxiliary equipment, pipe lines, etc., for municipal waterworks and sewage system. Fund of $63,000 has been secured through Federal aid. Hawley, Freese & Nichols, Capps Building, Fort Worth, Tex., are consulting engineers.

Common Council, Santa Anna, Tex., plans installation of pumping machinery and accessories, pipe lines, fittings, etc., for new municipal water system; fund of $35,000 has been secured through Federal aid. M. M. Moseley & Associates, Coleman, Tex., are consulting engineers.

WASHINGTON DISTRICT

Bureau of Yards and Docks, Navy Department, Washington, asks bids until Sept. 12 for relocating equipment storehouse at Marine Barracks, Quantico, Va., including new steel work, roofing and sheet metal work, pressed steel and steel rolling doors, electrical system, etc., and railroad spur track (Specification 7765).

Hagerstown Brewing Co., Hagerstown, Md., has acquired plant of Hagerstown Ice Co., and will remodel for new brewery. Cost over $65,000 with equipment.

Commanding Officer, Aberdeen Proving Ground, Aberdeen, Md., asks bids until Sept. 12 for flanges, expansion joints, float and thermostatic traps, tee branches, elbows and other fittings (Circular 23).

Chemical Warfare Service, Edgewood Arsenal, Md., asks bids until Sept. 10 for 17,625 lb. brass and quantity of brass tubing (Circular 20).

Purchasing Officer, Department of Interior, Washington, asks bids until Sept. 10 for one gasoline-operated dragline, including a dragline bucket and clamshell bucket, ½-cu. yd. capacity with 35-ft. boom.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Sept. 14 for five motor-generator sets, five motor controllers, five generator controls and distribution switchboard, parts, etc., and 30 distribution transformers (Schedule 3184) for Washington and Mare Island yards; 24,000 metal stampings (Schedule 3215) for Portsmouth and Mare Island yards.

WESTERN PENNA.

National Armature & Electrical Works, Bluefield, W. Va., has let general contract to John Heckart, 17 South High Street, Columbus, Ohio, for new one-story plant, 40 x 90 ft., at Columbus. Company will remove present plant to new location. Other units will be built later. Cost about $40,000 with equipment. R. R. Royce, 2176 North Parkway, Columbus, is architect.

H. J. Heinz Co., 1062 Progress Street, Pittsburgh, canned food products, has leased property on South Carrollton Avenue, New Orleans, for new two-story factory branch, storage and distributing plant. Cost close to $35,000 with equipment. Company has work under way on three-story addition to branch plant at Leamington, Ont. Cost about $125,000 with machinery.

United States Engineer Office, Pittsburgh, will soon take bids, closing on or about Oct. 15, for new Tygart Valley reservoir dam in Monongahela River, near Grafton, W. Va., 490 ft. long and about 237 ft. above foundation. Cost about $12,000,000.

MICHIGAN DISTRICT

Banner Brewing Co., Saginaw, Mich., Fritz Goebel, president and general manager, plans new brewery. Company is arranging for sale of stock to total $395,000, considerable part of fund to be used for purpose noted.

L. A. Young Spring & Wire Corp., 9200 Russell Street, Detroit, has let general contract to O. W. Burke Co., Detroit, for one-story addition to plant on Clay Avenue, 113 x 131 ft. Cost about $40,000. It will be occupied under lease by Detroit Moulding Corpn., 1601 Clay Avenue.

H. W. Scofield has purchased Stowe Building, Howell, Mich., and will remodel for manufacture of metal stampings.

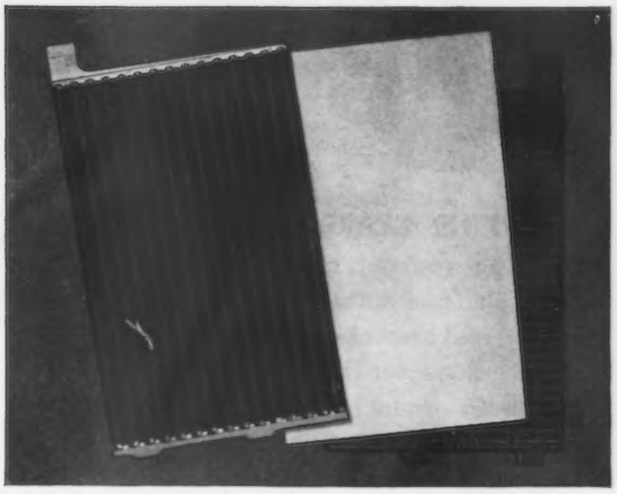
Lapeer Tool & Mfg. Co., 93 Howard Street, Lapeer, Mich., has been organized by David W. Ovaitt, 13501 Dexter Boulevard, Detroit, and associates, to manufacture tools, jigs and kindred equipment.

Leonard Refrigerator Co., Grand Rapids, Mich., a subsidiary of Kelvinator Corpn.,

Left (below): Exide-Ironclad Positive Plate, showing the slotted rubber tube construction.

Center: The new Exide Mipor Separator—the permanent storage battery plate insulator.

Right: Negative plate.



A GOOD BATTERY MADE STILL BETTER!

Exide-Ironclad Batteries with the new Exide Mipor Separators offer outstanding advantages

OPERATORS of electric industrial trucks and switching locomotives know that Exide-Ironclad Batteries improve hauling service by delivering unfailing power throughout each day—that they have ample power in reserve for exceptional loads and grades. And for more than twenty years, Exide-Ironclads have proved that they will cut material handling costs.

These batteries now offer a further outstanding improvement, in Exide Mipor Separators—at no increase in price.

Exide Mipor is vulcanized rubber, permeated by microscopic pores so numerous as to permit free diffusion of the electrolyte, and so minute as to form a barrier to the smallest particles of active material. Exide Mipor Separators easily withstand the most severe vibration, and will not deteriorate under the toughest operating conditions. They are unaffected by the electrolyte, and immune to the heat encountered in a battery. They function as permanent plate insulators, and will last the life of the battery.

With their Exide-Ironclad positive plates, which retain the active material in slotted rubber tubes, and with their new Exide Mipor Separators, Exide-Ironclad Batteries offer longer life and still greater dependability and economy. Why not improve your hauling service and cut costs with Exide-Ironclads? Write for new folder giving full details on Exide Mipor, the permanent storage battery plate insulator.

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WITH EXIDE MIPOR SEPARATORS

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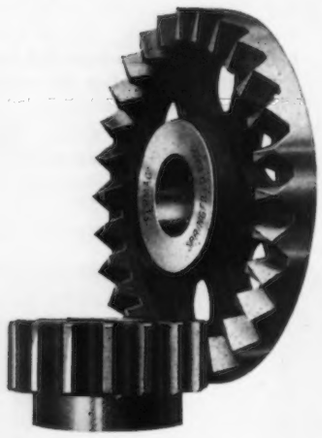
for
Smoother Operation
Greater Durability



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SPRINGFIELD, MASS.

14250 Plymouth Street, Detroit, has work under way on two plant additions, totaling about 30,000 sq. ft. floor space. Cost over $100,000 with machinery.

SOUTH CENTRAL

Louis Hunter Distillery Co., Lexington, Ky., has plans for new distillery at Lair, Ky., with steam power house, machine shop and other units. Cost over $85,000 with equipment. Carl J. Kiefer, Schmidt Building, Cincinnati, is consulting engineer.

Town Council, Falkville, Ala., plans installation of 60,000-gal. capacity steel tank on 75-ft. steel tower, pumping machinery and auxiliary equipment, pipe lines, etc., for extensions and improvements in municipal waterworks. J. B. McCrary Co., Atlanta, Ga., is consulting engineer.

McKibbon Universal Wrench Co., Nashville, Tenn., has been organized by Robert A. Pitner and J. H. Simpson, 1511 Hawkins Street, to manufacture wrenches and kindred tools.

Town Council, Hamilton, Ala., plans installation of pumping machinery and accessory equipment, pipe lines, etc., for new municipal waterworks. Fund of $35,000 has been secured through Federal aid. J. B. McCrary Co., Atlanta, Ga., is consulting engineer.

MIDDLE WEST

Hollup Corpn., 3333 West Forty-eighth Place, Chicago, manufacturer of welding rods and equipment, has asked bids on general contract for one-story addition. Cost about $40,000 with equipment. A. Epstein, 2001 West Pershing Road, is architect and engineer.

Signal Corps Procurement District, 1819 West Pershing Road, Chicago, asks bids until Sept. 11 for quantity of terminal boxes (Circular 9).

Department of Public Property, Springfield, Ill., Willis J. Spaulding, commissioner, asks bids until Sept. 17 for instruments, piping and other equipment for municipal electric light and power plant. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

City Auditor, Charles J. Evanson, Grand Forks, N. D., asks bids until Sept. 10 for automatic coal stoker for power house at city hospital.

District Commander, Twenty-third Forestry District, Camp Marion, Marion, Ill., asks bids until Sept. 14 for power house, pumping plant, one-story equipment storage and distribution building and other structures at Camp Robbs, Dixon Springs, Ill. (Circular 66).

Heating Unit Corpn., Cedarburg, Iowa, has been organized by J. and H. Rademacher, and C. H. Boyle, Cedarburg, capital $100,000, to manufacture heating equipment and electrical devices.

Dubuque Packing Co., Sixteenth and Sycamore Streets, Dubuque, Iowa, meat packer, has engaged H. Peter Henschien, 59 East Van Buren Street, Chicago, architect and engineer, to draw plans for two-story addition, 100 x 120 ft. Cost close to $100,000 with quipment.

City Council, Adams, Wis., is about to ask bids for $110,000 waterworks plant designed by A. E. McMahon Engineering Co., Menasha, Wis., and for which PWA funds have been allotted. A. J. Walczyk is city clerk.

Badger Paper & Pulp Mills, Inc., Peshtigo, Wis., has started work on an addition 70 x 160 ft., two stories and basement, to double capacity of waxed products department. Cost $75,000 with equipment.

City Council, Rockwell City, Iowa, plans new pumping plant for municipal water supply, using Diesel engine-operated pumping units, capacity about 5000 gal. per hr. Cost $25,000 with equipment.

PACIFIC COAST

Santa Cruz Portland Cement Co., Crocker Building, San Francisco, has asked bids on general contract for new branch storage and distributing plant at Long Beach, Cal., with treatment mill and packing house. Cost about $100,000 with equipment. R. A. Kinzie is chief engineer.

Bureau of Reclamation, Denver, opens bids Oct. 10 for 2300-volt switching equipment, including oil circuit breakers, outdoor-type lightning arresters, motor-operated disconnecting switches, bus structure with current transformers, grounding reactors and accessories for Boulder Dam power plant, Nevada-California (Specification 589).

City Council, Coeur d'Alene, Idaho, plans new municipal electric light and power plant, and electrical distribution system. Also extensions and improvements in municipal waterworks, including new equipment. Fund of $650,000 has been secured through Federal aid.

Board of Regents, State College of Washington, Pullman, Wash., will soon take bids for equipment for new central power house at institution, including boilers, pumps, mechanical fans, feed water heaters, water-treating apparatus, switchboard, etc. Bids have been asked for building, 60 x 100 ft. Fund of $265,000 has been secured through Federal aid. Stanley A. Smith, Pullman, is college architect.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Sept. 11 for 16 turbine-driven fuel oil booster pumps and spare parts (Schedule 3149); until Sept. 14, one motor-driven tool-grinding machine (Schedule 3207); until Sept. 18, 78 unit heaters (Schedule 3268) for Puget Sound Navy Yard; until Sept. 14, 80,000 lb. bar steel (Schedule 3219); until Sept. 18, 97,200 lb. medium steel plates (Schedule 3220) for Mare Island Navy Yard; until Sept. 18, 135 electric ventilating fans and spare parts (Schedule 3195) for Mare Island and Puget Sound yards.

State Architect, George B. McDougall, Public Works Building, Sacramento, Cal., asks bids until Sept. 18 for new steam power plant at State Hospital, Camarillo, Cal.

City Council, Torrance, Cal., plans installation of elevated steel tank, 250,000-gal. capacity on 150-ft. tower, aeration plant equipment, pumping machinery and other equipment for extensions and improvements in municipal waterworks. Cost over $75,000. Salisbury, Bradshaw & Taylor, 714 West Tenth Street, Los Angeles, are consulting engineers.

Hughes-Mitchell Processes, Inc., 618 Majestic Building, Denver, has let general contract to Austin Co. of California, Los Angeles, for new chemical processing plant at Torrance, Cal., for the reduction of lead and zinc metals. Initial units will cost close to $200,000 with equipment, and the ultimate plant about twice that sum. Lafayette M. Hughes and Thomas A. Mitchell are heads of company.

Selma Union High School District, Selma, Cal., plans rebuilding of one-story mechanical shop at local high school, recently destroyed by fire. New equipment will be installed.

United States Gypsum Co., 300 West Adams Street, Chicago, manufacturer of building materials, metal lath, roofing, etc., has taken over plant and business of Star Roof Corpn., 8430 Quartz Avenue, Southgate, Los Angeles, and will operate as new branch factory for Pacific Coast trade.

FOREIGN

Guest, Keen & Nettlefolds, Ltd., London, England, operating iron and steel works at Smethwick, Stirchley, Cardiff, Rogerstone and other points, plans addition to East Moor Works, Cardiff, for production of steel rods, bars, etc., replacing present plant at Castle Works, Rogerstone. Cost about $750,000 with equipment.

National Oil Co., Campana, near Buenos Aires, Argentina, plans rebuilding part of bulk oil storage and distributing plant recently destroyed by fire. Loss over $3,000,000 with equipment, tanks, etc. Company is affiliated with Standard Oil Co., New York.

Municipal Government, Ponta Delgada, Azores Islands, asks bids until Nov. 5 for equipment for hydroelectric generating plant, including turbo-generator unit of about 450-hp. rating, transformers, switchboard, switchgear and accessories.

Government Railways of Italy, Rome, are considering new electric power plant near Udine, Italy, for power supply for electrified railway from Trieste to Tarviso. Cost close to $200,000 with equipment.

Canada Foundries & Forgings, Welland, Ont., will rebuild section of drop forge plant destroyed by fire Aug. 15 Loss about $60,000.

Hyman-Michaels Co., Chicago broker and dealer in scrap iron and steel, has purchased the Northern Indiana Railway and the Kansas City, Clay County & St. Joseph (Mo.) Railway, for dismantling purposes. The Northern Indiana line comprises about 100 miles of trackage and the Kansas City line approximately 90 miles of main line track.

Keystone Steel & Wire Co., Peoria, Ill., in the year ended June 30, had net profit of $1,152,640. This compares with net profit of $195,559 in the preceeding fiscal year. Earned surplus of $3,387,983 at the end of the fiscal year compares with $2,950,806 at the end of the previous year.

INCREASED MACHINABILITY BRINGS *Increased Production*

The use of Jones & Laughlin Improved Bessemer Screw Steel for the parts shown resulted in production increases ranging from 5% to 50%. These are but a few of a great many similar cases in our files on customers' experience.

Your production, too, will probably respond in a similar way. The radical improvement in machining quality is found in both S.A.E. 1112 and **J&L** Special High Sulphur Bessemer Screw Steel, in hot rolled bars, cold finished bars, and drawn wire. Your inquiry, either general or specific, will be welcome.

This material can be supplied magnetically tested for imperfections, at a slight extra charge.

J&L *Improved* BESSEMER SCREW STEEL

No Change In Chemistry Or Physical Properties

50%
Production Increase
⅝" Round, Cold Drawn
J & L Improved Special High
Sulphur Bessemer Screw Steel

42.8%
Production Increase
¾" Round, Cold Drawn
& L Improved, S.A.E. 1112

38.5%
Production Increase
1 1/16" Round, Cold
Drawn J & L Improved
Special High Sulphur
Bessemer Screw Steel

20%
Production Increase
¾" Round, Cold Drawn
J & L Improved
S.A.E. 1112

18%
Production Increase
¾" Round, Cold Drawn
J & L Improved
S.A.E. 1112

11%
Production Increase
⅜" Round, Cold Drawn
J & L Improved Special High
Sulphur Bessemer Screw Steel

5%
Production Increase
½" Round, Cold Drawn
J & L Improved
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—a special class of B & L cold finished bars, designed for the needs of today.

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Their economy invites your consideration, for these *drawn, ground and polished* Small Rounds may be substituted for more expensive steels where special hardening qualities are unnecessary, as in small shafting of extreme accuracy and concentricity.

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COLD DRAWN BARS TURNED SHAFTING
FREE-CUTTING SCREW STOCK
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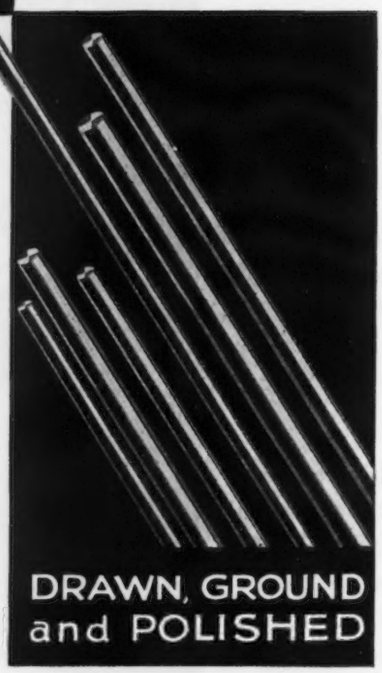

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New Method of Casting Hollow Ingots

THE production of hollow forgings for boiler drums and containers has become of increasing importance in Sheffield, England, during the past year or two, largely because of the requirements of the electrical and other steam-raising industries, and an innovation has just been introduced which will materially facilitate and cheapen that production. This consists of an improved method of casting hollow ingots, invented by Arthur Brearley, brother of Harry Brearley, noted metallurgist.

The chief manufacturers of large hollow forgings in the United Kingdom are Thos. Firth & John Brown, the English Steel Corporation, and Wm. Beardmore & Co., and these concerns, together with Brown, Bayley's Steelworks, have each nominated a director of the Brearley Ingot Co., which has just been formed to exploit the new process.

The ordinary process of making a large hollow forging consists in producing first the usual type of solid ingot, which, after stripping, is first heated and then cooled slowly in an annealing furnace in order to avoid internal cracks. This annealing process may take from seven to 14 days, according to the size of the ingot. After annealing the ingot is trepanned; in other words, it is machined in such a way that the solid core can be removed from it. After this operation the ingot is reheated and forged in the usual way under a press on a mandrel. The Brearley method allows the hollow ingot, as soon as it is stripped, to be charged into a reheating furnace and forged at once, so that the long annealing operation required by the solid ingot and the trepanning operations are unnecessary. The feature of the process is that, when once formed from the fluid steel, the hollow ingot is perfectly free to contract without any resistance being exerted by the core.

Remarkable Expansion Alloy Steel in 1933

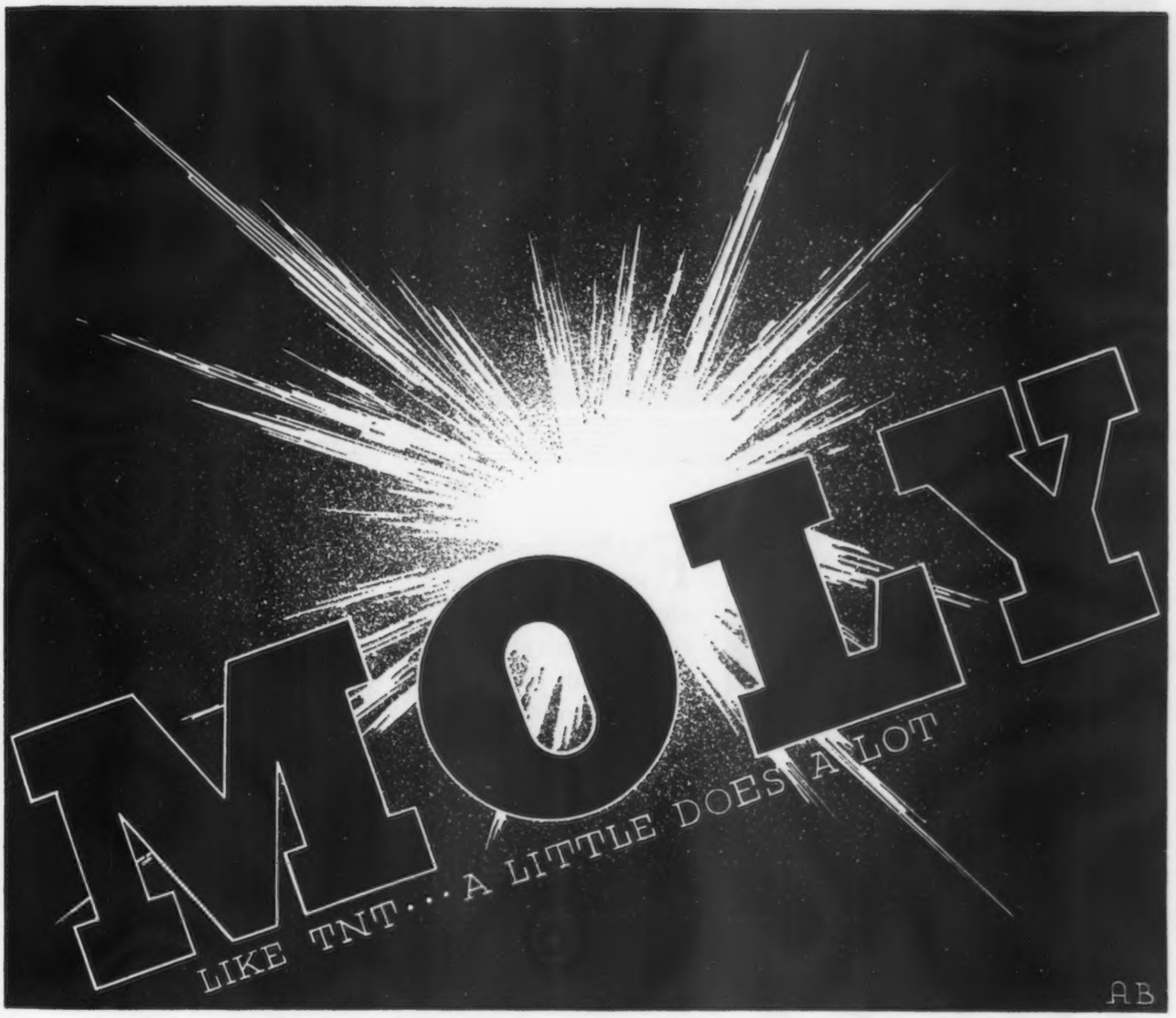
A SHARP recovery in the American alloy steel industry in 1933 is revealed by the annual statistics, recently issued, of the American Iron and Steel Institute. The data show that last year 1,547,183 gross tons of alloy steel ingots and castings were made, which compares with 798,604 tons in 1932 and with 1,455,913 tons in 1931. The 1933 output was therefore back to the level of that of 1931.

The recovery is still sharper and more significant if comparisons are made on a percentage basis with other years. The official statistics in gross tons are as follows:

Year	Total Steel	Total Alloy Steel	Per Cent Alloy Steel
1929	56,433,473	3,957,207	7.01
1930	40,699,483	2,443,311	6.00
1931	25,945,501	1,455,913	5.61
1932	13,681,162	798,604	5.84
1933	23,232,347	1,547,183	6.66

Thus the percentage of alloy steel ingots and castings of the total steel ingots and castings produced in 1933 was 6.66 per cent, which is not only larger than the percentage of 5.61 per cent in 1931 but is not far short of the 7.01 per cent in the boom year of 1929, which was the record for all time.

It is significant to note that, with the total steel output in 1933 only about 41 per cent of the record total of 1929, the alloy steel production last year was 6.66 per cent of the total output of the country, as compared with 7.01 per cent in 1929. Thus the relative increase in alloy steel production last year has been substantial, with the proportion of the total nearly back to the record peak five years ago. This movement is eloquent testimony of the expanding demand for alloy steels of all kinds and types.



WHETHER it be toward the application of strength or the resistance to shock or wear, any added element which justifies its cost is usually welcome. "Moly" in iron or steel does more than that.

Example: A small amount of Molybdenum, when added to cast iron, will increase its wear resistance to an extent that far outweighs the added cost. The following comparison of wear, as measured on the Amsler Machine, brings out this effect:

	Loss in weight per sq. cm. *after* 105,000 *cycles*
Plain Iron	7.3 grams
Molybdenum Iron (1% Mo.) . .	1.0 "

By the same token, Moly increases the strength (tensile and creep) of iron or steel. It reduces temper embrittlement—increases toughness, without loss of hardness. It actually enhances the characteristics of other alloys. Yet it makes for easier machinability, forging and welding. Paradoxical? It seems so. But Moly qualities are no longer theories. Instances without number have proved them.

The story of Molybdenum grows bigger and bigger as new applications and analyses come to light. Toward keeping executives and engineers informed of such progress, we publish a house organ, "*The Moly Matrix*," which we will gladly mail to you regularly on request. Write also for these interesting new books: "*Molybdenum in* 1934" and "*Molybdenum in Cast Iron*—1934 *Supplement*." Toward the solving of any alloy problems peculiar to your particular needs or products we invite you to consult our metallurgists and to make use of our modern experimental laboratories in Detroit. Climax Molybdenum Company, 295 Madison Avenue, New York.

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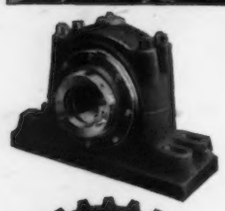

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Germany Develops Tube Rolling Mill

THE well-known German machinery firm of Demag, Duisburg, has produced an improved type of rolling mill which is the invention of M. Roeckner. This rolling mill permits of any material which can be rolled being used in producing seamless thick-walled tubes and hollow bodies up to about 33 ft. in length. Hitherto it has only been possible to make such parts with a lot of trouble by forging and then turning the pieces.

The Roeckner mill consists of several pairs of rolls arranged radially. The outer rolls are mounted in a ring-shaped stand and driven through a pinion housing, while the inner rolls are carried by a mandrel head in the interior of the hollow body. The axes of the pairs of rolls, which comprise different grooves, are inclined slightly to the axis of the steel bloom, so that the rolls trace helical lines on the inside and outside of the bloom as it is drawn automatically through the mill by the rolls. While the first pair of rolls produces a corrugation inside and outside running round the bloom in a helical line, the succeeding pair of rolls gradually widens the corrugation until the surface of the bloom becomes smooth in its passage through the mill.

A Roeckner mill now under construction will be capable of rolling hollow bodies up to 71 in. diameter and about 40 ft. in length, but considerably heavier construction than this is possible. A mill of this type is now in satisfactory operation in Germany.

Electric Steel Output Expanded in 1933

DESPITE the broad and devastating depression in the American steel industry during the last four years, there has been a marked expansion in the use of the electric furnace as a melting medium for all kinds of steel.

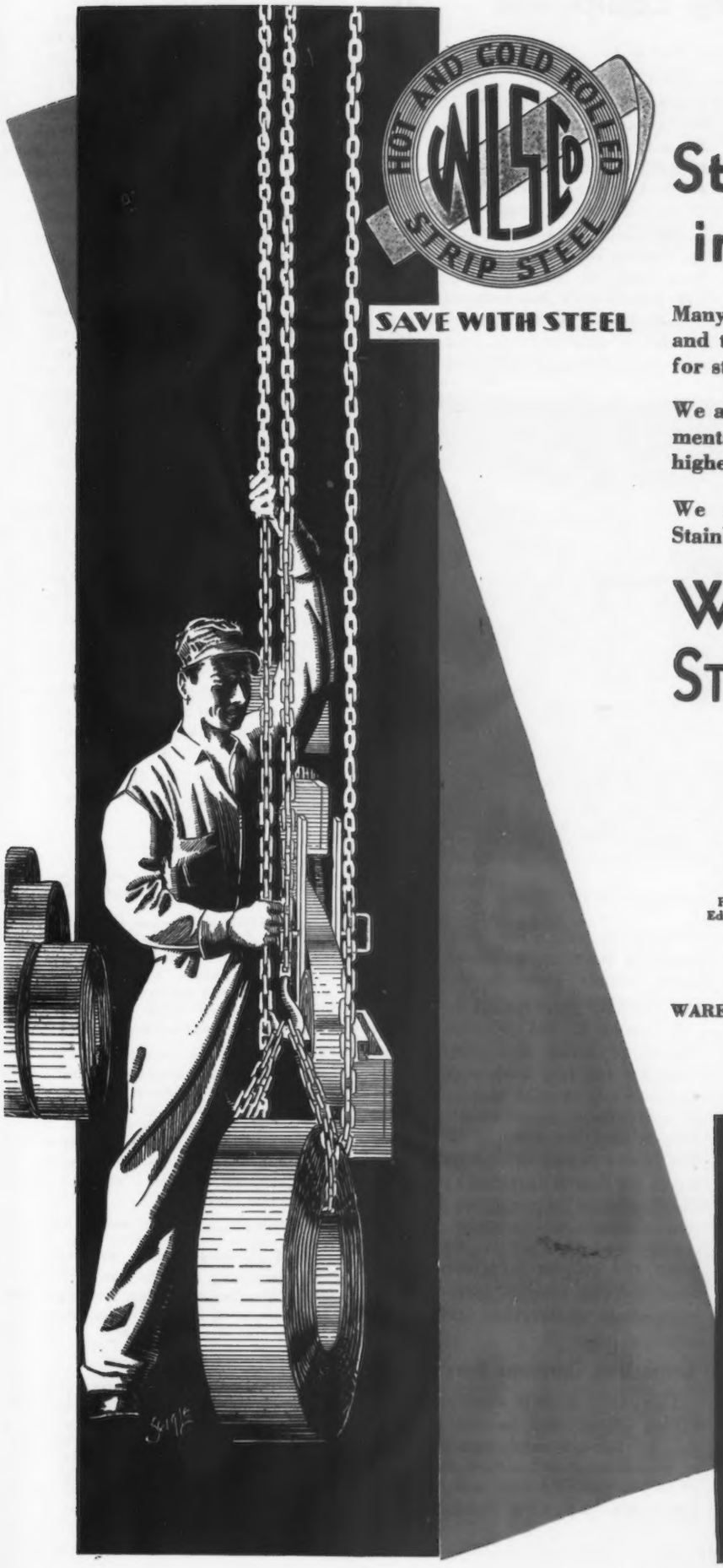
According to the annual statistics of the American Iron and Steel Institute recently made public, the percentage of electric steel ingots and castings of the total output of steel ingots and castings in 1933 was larger than for any year in the last five years. The official data in gross tons are as follows:

Year	*Total Steel*	*Electric Steel*	*Per Cent Electric*
1929	56,433,473	951,431	16.86
1930	40,699,483	612,599	15.05
1931	25,945,501	410,942	15.83
1932	13,681,162	241,111	17.77
1933	23,232,347	421,203	18.13

The percentage of electric steel of the total steel production of the American steel industry in 1933 was 18.13 per cent. In 1929 it was 16.86 per cent. With the total steel production in 1933 only 41 per cent of the steel output in 1929, the record year, the quantity of electric steel last year was considerably larger, measured on a percentage basis, than in 1929, or 18.13 per cent compared with 16.86.

After a sharp drop in 1930 to 15.05 per cent, there was a gradual expansion each year, culminating in the splendid record for 1933—decisive testimony to the growing use of the electric furnace as a melting medium for the production of steel.

It should be emphasized also that the 1933 figure of 18.13 per cent of electric steel tops all previous records since the war. The low point was 8.56 per cent in 1921 and its previous high was 17.77 per cent in 1932. In 1927 and 1928 the percentages were 14.83 and 15.58 per cent respectively.



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HOT AND COLD ROLLED STRIP

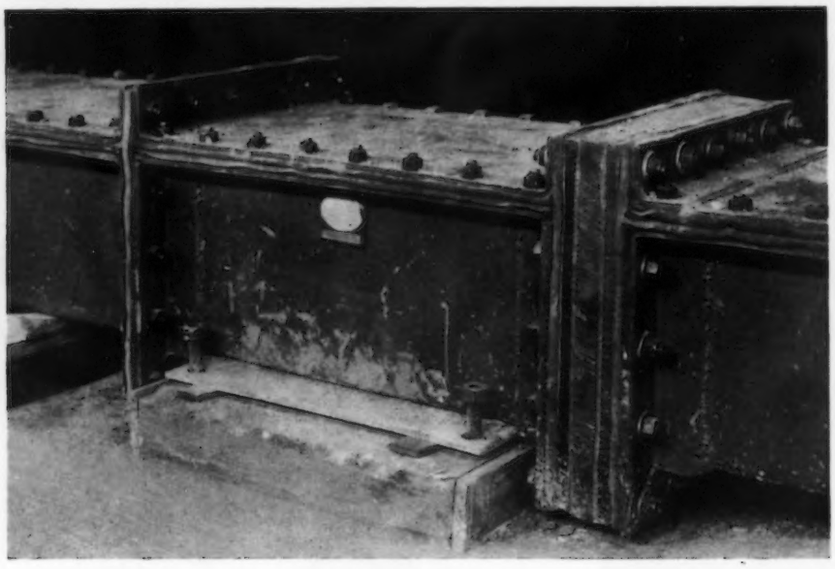
Modern Strip Pickling Equipment

(Concluded from Page 37)

ber covered rolls a Triflex lined drip pan is placed under the roll to collect the drip acid and wash water. This drip pan is connected to the acid sewer by rubber hose.

Control of Fumes

The four acid tanks are equipped with hard rubber lined covers which are in sections and easily removable. The center sections are connected to a 16-in. hard rubber lined steel duct which, in turn, is connected to a rubber lined steel scrubber and rubber lined steel exhauster. Scrubbers are provided with cold water sprays which almost completely remove the acid content in gases, so that the exhaust gases may be passed safely to the trunk sewer without danger of damage to it.



All-rubber expansion joints in main steel sewer shell

All wash or scrubbing water is, however, conducted to the special acid sewer through stoneware trap. So complete and effective is the fume control by this arrangement that there is no evidence of a pickling operation being conducted in the building from the standpoint of obnoxious fumes or vapors. This renders the most ideal working conditions the writer has ever seen for this kind of operation!

Special Acid Sewers

The invisible damage to foundations and underground structures which occurs as a result of seepage of acid into the soil through defective submerged sewers is a tremendous and incalculable expense. Inland Steel engineers have recognized this condition and have taken the necessary steps to permanently eliminate it by scientifically designing a sewer with a life expectancy comparable to that of their other equipment. The factor of invisibility has been circumvented by placing the sewer well above the floor level, so that if leaks develop they immediately become apparent before damage is done. The sewer shell is made of steel in 25-ft. long flanged sections and flanged at the top for the purpose of bolting on covers. The sewer is built to withstand two to three pounds pressure if occasion should demand.

In order to aid in dilution and cooling of waste acid, the overflow from hot and cold wash tanks is carried to waste through this sewer line. It is of utmost significance to Inland officials that the floors of their pickling room are now dry. Liquid showing on the floor is regarded as a signal for immediate investigation and action. Contrast this condition with the conventional, s l o p p y, acid-soaked floors and reeking structures of the usual pickling establishment with its tremendous destruction, delay and costs!

Entire Unit Functions Economically

This unit is still relatively new, having served with perfect satisfaction for approximately two years. It is estimated that another two years of uninterrupted service will establish a new low in pickling costs, and conclusively demonstrate this to be a pickling construction without peer. Today the rubber, brickwork and steel are in splendid condition, with no apparent deterioration of any kind, and give promise of fulfilling the unit's expected life. To producers and fabricators of steel this development, in which steel plays so important a part in the pickling of steel, should be of genuine interest and importance, for it opens up a new and practical outlet for products of their own manufacture.

Loss of acid and damage to floors or building are completely eliminated. Working conditions are improved. The typical, unsightly p a n o r a m a of former years has vanished. Today there stands a modern, well groomed, impressive piece of equipment in which the same high standard of economy and efficiency prevails as in other units of the hot and cold mill.

It must be evident that an engineering achievement such as this had, of necessity, to be directed by a personnel with foresight, courage and perseverance. To Mr. Frank Carroll, chief engineer of Inland, who pioneered this development, the writer wishes to pay a well-deserved tribute for his persistence and resourcefulness in conquering the various problems. Thanks are extended to those other Inland officials who unselfishly permitted to be told the story of Inland's installation — a story from which all may benefit.

TRADE NOTES

Detroit Electric Furnace Co., Detroit, has appointed Case Hardening Service Co., Cleveland, as sales representative for its new rocking electric furnace recently developed in Detroit. This new furnace includes automatic timing mechanism which changes the angle of rock without operating attention.

Union Switch & Signal Co., Pittsburgh, effective Sept. 1, discontinued its commercial drop forge business and transferred all dies and unfilled orders to the Champion Machine & Forging Co., Cleveland. Finley L. Walton, who has directed commercial drop forge sales for the Switch & Signal company, has become affiliated with the Champion company in a similar capacity.

Sier-Bath Co., New York, maker of precision gears, has received contract from the S-B Gear Corpn., New York, to manufacture the latter company's complete line of speed reducers. The Gear corporation has spent several years developing its new speed reducers, a complete line of which will soon be placed on the market.

Ball Bearings.—New Departure Mfg. Co., Bristol, Conn. Booklets illustrating bearings "lubricated for life," comprising a self-enclosed construction with the ball bearings sealed permanently. One of the developments has been made for the mine car wheel and another shows the adaptation of the principle to conveyor rolls.